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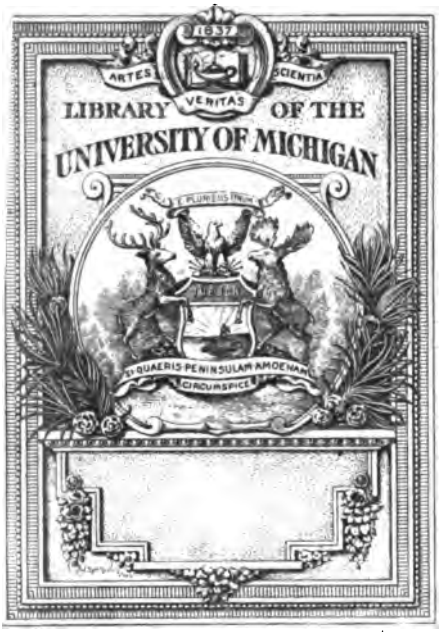

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THE OHIO STATE MEDICAL SOCIETY

TRANSACTIONS

OF THE

FIFTY-THIRD ANNUAL MEETING

HELD AT

COLUMBUS, OHIO

MAY 4, 5, 6, 1898

EDITED BY

P. MAXWELL FOSHAY, M. D.

CLEVELAND, OHIO

CLEVELAND, O.
J. B. SAVAGE PRESS
1898

THE

FIFTY-FOURTH ANNUAL MEETING

OF THE

OHIO STATE MEDICAL SOCIETY

WILL BE HELD IN

SPRINGFIELD

MAY 10, 11 AND 12, 1899

PREFACE

IN the present volume of Transactions no change has been made in the general appearance as compared with former volumes. Some admirable innovations in arrangement that were instituted by the previous editor have been retained and somewhat amplified. Special endeavor has been made this year to publish the Transactions at as early a day as possible. In this the Editor has been materially assisted by the care and promptness of the Secretary of the Society in collecting and forwarding nearly all the papers published in the volume and in preparing for publication the various membership lists, as well as the minutes.

The intelligent and earnest cooperation of members of the printing firm which had the contract for the publication of this volume of the Transactions, has greatly expedited its issuance in acceptable form.

The publication this year of the full membership lists of the societies auxiliary to the State Society has increased the size of this volume as compared with that of last year when these lists were omitted.

In spite of care some errors have no doubt crept into this volume and for these the Editor asks indulgence.

P. May Hoskins

CLEVELAND, JULY 25, 1898

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OHIO STATE MEDICAL SOCIETY

PRESIDENT.....N. R. COLEMAN, M. D., Columbus
FIRST VICE PRESIDENT.....P. J. KLINE, M. D., Portsmouth
SECOND " " .....E. J. WILSON, M. D., Columbus
THIRD " " .....T. M. SABIN, M. D., Warren
FOURTH " " .....D. W. STEINER, M. D., Lima
TREASURER.....JAMES A. DUNCAN, M. D., Toledo
SECRETARY.....JOHN A. THOMPSON, M. D., Cincinnati
ASSISTANT SECRETARY.....H. M. W. MOORE, M. D., Columbus

COMMITTEES

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H. J. HERRICK, M. D., (96) J. E. COOK, M. D., (97)
H. A. ZIMMERMAN, M. D., (98)

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T. C. HOOVER, M. D., (96) DAN MILLIKIN, M. D., (97)
R. B. HART, JR., M. D., (98)

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J. M. FRENCH, M. D., (98)
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CHARLES GRAEFE, M. D., (96) J. A. KIMMEL, M. D., (97)
D. N. KINSMAN, M. D., (98)

Committee on National Medical Legislation

L. B. TUCKERMAN, M. D., Cleveland

Admission and Medical Societies

W. C. CHAPMAN, M. D., (94) A. B. RICHARDSON, M. D., (95)
OSCAR HASENCAMP, M. D., (96) J. E. RUSSELL, M. D., (97)
THOMAS HUBBARD, M. D., (98)

Growth and Prosperity

WM. H. HUMISTON, M. D., term expires 1903 C. L. BONIFIELD, M. D., term expires 1902
S. S. HALDERMAN, M. D., 1901 FRANK WARNER, M. D., 1900
J. W. HULICK, M. D., 1899

Arrangements for Springfield Meeting, 1899

JOHN W. HULICK, M. D. HENRY SEYS, M. D.
JOHN H. ROGERS, M. D. JOHN P. DUGAN, M. D.
ALLEN H. VANCE, M. D.

OHIO STATE MEDICAL SOCIETY

At the Seventeenth Annual Meeting of the Ohio State Medical Society, the following resolution was adopted:

Resolved, That the publication of any address, prize essay, or other paper, by this Society, is no evidence of its endorsement of the sentiments therein contained.

CHAPTER I

THE MINUTES

The Fifty-third annual session of the Ohio State Medical Society was called to order by the President, Dr. Wm. H. Humiston, at 2 p. m., May 4, 1898, in the Great Southern Theater, Columbus. The address of welcome was made by Dr. E. J. Wilson. Response was made by the President.

The report of the Committee of Arrangements was made by the Chairman, Dr. E. J. Wilson.

The amendment to the constitution, offered by Dr. R. Harvey Reed at Cleveland at the Fifty-second annual meeting, was read and on motion adopted. The amendment was as follows:

Article III, Section 3, second paragraph, to read: "Every applicant shall deposit with the Treasurer the sum of $1.00 as a membership fee," etc.

It was suggested by Dr. H. S. Straight, Cleveland, that the amendment be discussed. Dr. D. N. Kinsman, Columbus, moved a reconsideration of the motion by which the vote was carried. The point of order was made by Dr. T. C. Miller, Massillon, that Dr. Kinsman had voted against the motion. The point of order was sustained. A motion was then made by Dr. E. S. Stevens, Lebanon, to reconsider the vote by which the amendment was carried. This motion was discussed by Drs. J. F. Baldwin, Columbus; W. H. Humiston, Cleveland, and D. N. Kinsman, Columbus. The motion to reconsider was lost.

Dr. C. A. L. Reed, Cincinnati, offered the following resolution:

"Resolved, That the President be, and hereby is, authorized to appoint for the present meeting nine members who shall constitute an executive committee, to which all

new business shall be referred for consultation and report. The report of the executive committee shall be the special order at the beginning of each session."

The motion carried.

The Secretary's report was read and received. The roll of committees was called.

The President filled the vacancies on the standing committees caused by the absence of the regular members.

The committees as announced by President Humiston were as follows, those names having asterisks affixed being appointed to fill vacancies:

Finance: H. J. Herrick, M. D., *R. B. Hall, M. D., *A. F. House, M. D., *G. S. Courtright, M. D., *F. C. Larimore, M. D.

Ethics: F. C. Larimore, M. D., *D. N. Kinsman, M. D., *J. S. Beck, M. D., *J. E. Brown, M. D., *R. J. Wenner, M. D.

Publication: J. C. Oliver, M. D., F. D. Bain, M. D., P. M. Foshay, M. D., *O. T. Maynard, M. D., *C. F. Hoover, M. D.

Legislation: J. F. Baldwin, M. D.

[The vacancies on this committee were not filled.—Ed.]

Admissions and Medical Societies: C. D. Noble, M. D., *G. A. Collamore, M. D., *Sherman Leach, M. D., *T. Clark Miller, M. D., *F. O. Marsh, M. D.

The President appointed as the Committee on Nominations, Drs. P. M. Foshay, C. F. Clarke, J. C. Oliver, E. S. Stevens, H. A. Zimmerman.

The President appointed as an executive committee for the meeting: Drs. H. S. Straight, Robert Sattler, W. C. Chapman, S. S. Halderman, Frank Warner, F. C. Larimore, August Rhu, W. J. Conklin, P. Max Foshay.

A paper, "Partial Cataract," was read by Dr. C. F. Clarke, Columbus, and was discussed by Dr. Robert Sattler, Cincinnati. The discussion was closed by Dr. Clarke.

A paper, "Some Aspects of Capital Punishment," was read by Dr. F. O. Marsh, Cincinnati, and discussed by Dr. D. N. Kinsman, Columbus.

A paper, "Functional Heart Murmurs," was read by Dr. C. F. Hoover, Cleveland.

A paper, "Psychic Treatment of Disease," was read by Dr. Philip Zenner, Cincinnati, and discussed by Dr. H. J. Herrick, Cleveland; Dr. Mary J. Finley, Mansfield; Dr. C. F. Hoover, Cleveland; Dr. E. Pearce, Steubenville, and Dr. J. U. Barnhill, Columbus. The discussion was closed by Dr. Zenner.

It was moved by Dr. F. O. Marsh that the Secretary be authorized to employ a stenographer to report the transactions of the meeting. The motion was carried.

A paper, "Intestinal Obstruction; Operation; Recovery," was read by Dr. Sherman Leach, Columbus, and discussed by Dr. J. F. Baldwin, Columbus; Dr. Ed. Rickets, Cincinnati; Dr. R. B. Hall, Cincinnati; Dr. F. F. Lawrence, Columbus; Dr. E. Pearce, Steubenville; Dr. A. F. House, Cleveland, and Dr. F. Warner, Columbus.

"Syphilis of the Upper Air-Passages" was read by Dr. Howard S. Straight, Cleveland, and discussed by Dr. J. A. Thompson, Cincinnati; Dr. M. J. Finley, Mansfield; Dr. G. W. Morehouse, Sparta, and Dr. H. J. Herrick, Cleveland.

"Irrigation with Salt-Solution and Other Fluids in Surgical Practice" was read by Dr. Hunter Robb, Cleveland, and discussed by Dr. H. J. Herrick, Cleveland; Dr. C. A. L. Reed, Cincinnati; and Dr. C. F. Hoover, Cleveland.

A partial report was made by the Committee on Admissions, and on motion the men whose names were favorably reported were elected to permanent membership.

It was moved by Dr. C. A. L. Reed, Cincinnati, that the Secretary be authorized to issue delegate certificates to members wishing to attend the American Medical Association. The motion was carried.

"Monstrosities *versus* Maternal Impressions" was read by Dr. G. S. Courtright, Lithopolis, and discussed by Dr. E. L. Leonard, Democracy, and Dr. G. A. Collamore, Toledo.

The session adjourned to attend a reception in the parlors of the Great Southern Hotel at 8 p. m.

THURSDAY MORNING SESSION, MAY 5

The meeting was called to order by President Humiston. The minutes of the previous session were read and approved. The Treasurer's report was read and referred to the Finance Committee. The report of the Committee on National Legislation was read by Dr. Tuckerman and referred to the Executive Committee.

A report was made by the Committee of Arrangements.

Dr. F. F. Lawrence offered a resolution: "Resolved, That the President appoint a committee, the President to be *ex-officio* chairman, to go to Denver to work in the interest of Ohio in general, and of Columbus in particular, in securing the next meeting of the American Medical Association for Columbus." This resolution was adopted.

President Humiston appointed as members of this committee: Dr. F. F. Lawrence, Dr. A. F. House and Dr. C. L. Bonifield.

A paper, "Movable Kidney," was read by Dr. Yeatman Wardlow, Columbus, and discussed by Dr. J. C. Reeve, Dayton; Dr. M. J. Finley, Mansfield; Dr. Ed. Rickets, Cincinnati; Dr. D. J. Merriman, Painesville; Dr. C. F. Hoover, Cleveland, and Dr. C. L. Bonifield, Cincinnati. The courtesies of the floor were extended by President Humiston to Dr. H. A. Hare, of Philadelphia, who was present.

A paper, "Studies in the Morbid Anatomy of Epilepsy," was read by Dr. A. P. Ohlmacher, Gallipolis, and discussed by Dr. D. N. Kinsman, Columbus; Dr. F. Warner, Columbus; Dr. H. A. Hare, Philadelphia; Dr. C. E. Beardsley,

Ottawa; Dr. J. B. May, New Holland; Dr. M. J. Finley, Mansfield, and Dr. E. B. Fullerton, Columbus.

A paper, "Uric Acid," was read by Dr. D. N. Kinsman, Columbus, and discussed by Dr. J. B. May, New Holland, and Dr. D. S. Hanson, Cleveland.

A partial report of the Committee on Admissions was made and approved.

A paper, "Lumbar Puncture," was read by Dr. R. J. Wenner, Cleveland.

A paper, "Removal of the Cecum for Malignant Disease," was read by Dr. J. C. Oliver, Cincinnati, and discussed by Dr. J. B. May, New Holland.

A paper, "Henrotin's Method in Pelvic Abscess," was read by Dr. J. C. Reeve, Jr., Dayton, and discussed by Dr. C. L. Bonifield, Cincinnati; Dr. J. F. Baldwin, Columbus; and Dr. Ed. Rickets, Cincinnati.

The Committee on Finance reported they had examined the Treasurer's books and accounts and approved his report. The report of the committee was adopted.

The Society adjourned to meet at 1:30 p. m.

THURSDAY AFTERNOON SESSION

Called to order by President Humiston. The minutes of the morning session were read and approved.

A report of the Committee on Publication was read by Dr. J. C. Oliver, and on motion the report was approved.

The report of the State Board of Medical Registration and Examination was read by Dr. N. R. Coleman and was referred to the Committee on Publication.

An address on the Rush Monument fund was made by Dr. C. A. L. Reed, Cincinnati.

"I take great pleasure in responding to your request to speak in behalf of this proposition. The medical profession is today without conspicuous representation in that great collection of national heroes, immortalized in marble,

standing beneath the dome of our national capitol. It is the proposition of those who have been alive to the conspicuous services of Benjamin Rush, and also to the self-respect of our own profession, to erect a monument to be placed in that great galaxy. It has been before the profession for a number of years but has not yet reached that amount which would entitle the committee to proceed with the work. At Philadelphia last year, that city where Rush lived and worked and from which emanated the fruits of his genius, a concerted action was inaugurated, calculated to secure the coöperation of the profession of each state of the Union. The proposed amount was proportioned among the different states. A very efficient committee was appointed for Ohio. Solicitations have been sent out in the usual way but like such solicitations, they have passed in many instances without notice. This is not creditable to the profession of this great state. It is therefore suggested at this meeting that an action shall be taken which shall secure the apportionment assigned to Ohio, that this committee may make a satisfactory report to the meeting in Denver.

"I move that tellers be appointed and the members given an opportunity to show their generosity in this behalf. I am sure when we realize that in Rush we had the highest exponent of the American physician, we had that prototype which will stand before us as an object for emulation. I move that three solicitors be appointed, or perhaps the committee appointed by the American Medical Association, if here present, be appointed to wait upon those present."

This motion was carried and the following were appointed to circulate through the audience: Dr. S. S. Halderman, Dr. A. F. House and Dr. E. W. Mitchell.

Nominations for officers for the ensuing year were now in order.

Dr. G. A. Collamore nominated for President Dr. Rufus B. Hall, of Cincinnati. Dr. Hall's nomination was sec-

onded by Drs. A. F. House, T. M. Wright, P. J. Kline, J. E. Brown, E. W. Mitchell and C. L. Bonifield.

Dr. C. A. L. Reed nominated Dr. N. R. Coleman, of Columbus. Dr. Coleman's nomination was seconded by Drs. C. E. Beardsley and E. H. Hyatt.

Dr. Bonifield moved that the Society proceed to ballot. The President appointed as tellers Drs. F. Warner of Columbs, C. L. Bonifield of Cincinnati and A. R. Baker of Cleveland. The tellers reported Dr. Hall 78 votes, Dr. Coleman 85 votes. Dr. Coleman was declared President for the coming year. It was moved and carried that Dr. Coleman's nomination be made unanimous.

The Committee on Nominations made the following report through its chairman, Dr. Foshay:

First Vice-President—Dr. P. J. Kline, Portsmouth.

Second Vice-President—Dr. E. J. Wilson, Columbus.

Third Vice-President—Dr. T. M. Sabin, Warren.

Fourth Vice-President—Dr. D. W. Steiner, Lima.

Treasurer—Dr. James A. Duncan, Toledo.

Secretary—Dr. John A. Thompson, Cincinnati.

Assistant Secretary—Dr. H. M. W. Moore, Columbus.

Committee on Finance—Dr. H. A. Zimmerman, Youngstown.

Committee on Ethics—Dr. R. B. Hart, Jr., Marietta.

Committee on Publication—Dr. J. M. French, Cincinnati. The Committee also recommended that Dr. J. E. Brown, of Columbus, be elected to fill the unexpired term of Dr. R. Harvey Reed, who has removed from the state.

Committee on Legislation—Dr. D. N. Kinsman, Columbus.

Committee on Admissions and Medical Societies—Dr. Thomas Hubbard, Toledo.

Dr. Lawrence moved that the report be received and the nominees be declared elected. This motion was carried.

The Society then proceeded to the selection of the next

place of meeting. An invitation to meet at Springfield was given by Dr. J. B. Dugan, the President of the Clark County Medical Society. This invitation was seconded in short addresses by the Secretary, Dr. B. D. Titlow and by Dr. Vance.

An invitation was also received from the Hotel Victory Company at Put-in-Bay.

It was moved by Dr. Straight that the Society meet at Springfield. This motion carried.

President Humiston then delivered the annual address.

A paper, "The Alcoholic Forms of Insanity," was read by Dr. E. G. Carpenter and discussed by Dr. D. N. Kinsman, Columbus; Dr. H. J. Herrick, Cleveland; Dr. L. B. Tuckerman, Cleveland, and Dr. J. A. Thompson, Cincinnati.

A paper, "Sequences of Abnormal Refraction," was read by Dr. D. R. Silver, Sidney, and discussed by Dr. A. R. Baker, Cleveland, and Dr. N. P. Davidson, Hilliards.

A letter from Dr. N. Senn was then read, regretting that he could not be present to deliver the annual address on surgery, because he had been called out with the Illinois troops. Dr. Tuckerman moved that Dr. Senn be requested to furnish his address for publication in the transactions. The motion carried.

A paper, "The Incision Less than One and a Half Inches in Appendicitis," was read by Dr. N. Stone Scott, Cleveland, and discussed by Dr. N. P. Davidson, Hilliards; Dr. F. Warner, Columbus; Dr. J. E. Sylvester, Wellston; Dr. J. F. Baldwin, Columbus; Dr. T. C. Martin, Cleveland; Dr. R. B. Hall, Cincinnati; Dr. J. B. May, New Holland; and Dr. L. B. Tuckerman, Cleveland.

The Executive Committee reported favoring the acceptance of the resignations that had been sent the Secretary.

Resignations—A. Titus, Portsmouth; T. M. Carroll, Springfield; H. H. Spiers, Ravenna; W. D. Hoge, Portland Station; J. T. Martin, Marion; Wm. R. Gifford, Toledo;

A. P. Renneker, Cincinnati; Theo. Bange, Cincinnati; J. G. Nau, Carroll; Amelia J. Prior, Xenia; Edwin Le Fevre, Sidney.

Removed from State—E. W. Heard, formerly at Sandusky; Charles F. Murphy, formerly at Portsmouth.

The amendments to the constitution proposed in the President's address were approved by the Executive Committee and adopted unanimously by the Society.

Article V, Section 4 (new): The Executive Committee of the Society shall be made up of the President, the four Vice-Presidents, the Secretary, the Treasurer, the Chairmen of the Standing Committees, and the retiring Presidents of the three years last past. Five shall be considered a quorum for the transaction of business.

Article VI, Section 7, (new): The duties of the Executive Committee shall be to consider and digest all business referred to it by the Society and to promptly report to the Society their findings and recommendations.

All motions, resolutions or other new and miscellaneous business shall be referred to the Executive Committee at once without motion; the Society, however, shall always have the right to order that a matter which would in regular order go to the Executive Committee shall be considered at once, or to order a matter out of the hands of the Executive Committee for immediate consideration.

Article VIII, third sentence, to read: "The Standing Committees shall be Committees on Finance, Admission and Medical Societies, Ethics, Publication, Medical Legislation, Growth and Prosperity, and a committee of one upon National Legislation."

A paper, "Obscure Cases of Gall-Bladder Disease," was read by Dr. E. S. Stevens, Lebanon, and discussed by Dr. Ed. Rickets, Cincinnati, and Dr. R. B. Hall, Cincinnati.

A partial report of the Committee on Admissions was

made, and the men whose nominations were reported favorably were elected to membership.

A volunteer paper, "The Use of the Modern Cystoscope," was read by Dr. B. O. Coates, of Cleveland.

The Society adjourned, to meet at 7:30 p. m. for the address of Professor H. A. Hare.

FRIDAY MORNING SESSION, MAY 6

Dr. D. N. Kinsman moved that the Society divide into surgical and medical sections, the program to be divided. This motion carried.

Drs. D. S. Hanson and J. C. Brown were appointed to fill the vacancies in the Committee on Admissions.

REPORT OF THE SURGICAL SECTION

A paper, "Is the Use of the Rectal Sound Scientific?" was read by Dr. T. C. Martin, Cleveland, and discussed by Dr. G. W. Crile, Cleveland, and Dr. A. H. Freiberg, Cincinnati.

The next paper, "Ectopic Gestation: What Cases to Operate on," was read by Dr. J. Ambrose Johnston, Cincinnati, and discussed by Dr. R. B. Hall, Cincinnati; Dr. D. Tod Gilliam, Columbus; Dr. D. S. Hanson, Cleveland; Dr. Y. Wardlow, Columbus; Dr. J. B. May, New Holland; Dr. F. F. Lawrence, Columbus, and Dr. J. B. Ray, Omega.

Dr. Herrick reported the following resolution: "Resolved, That the President and Secretary-elect and the chairman of the Committee of Arrangements be authorized to select the date of the next meeting." The motion carried.

The Committee on Nominations reported the following as the members of the Committee on Growth and Prosperity, the new committee provided for in amendments to the constitution: Dr. Wm. H. Humiston, five years; Dr. C. L.

Bonifield, four years; Dr. S. S. Halderman, three years; Dr. Frank Warner, two years; Dr. J. W. Hulick, one year.

The final report of the Committee on Admissions was made, and on motion the men whose names were recommended were elected to membership.

A paper, "Clinical Applications of Experimental Evidence of a Research into Collapse and Shock," was read by Dr. G. W. Crile, Cleveland, and discussed by Dr. D. T. Gilliam, Columbus; Dr. F. F. Lawrence, Columbus; Dr. Y. Wardlow, Columbus; Dr. C. F. Clarke, Columbus; Dr. J. B. May, New Holland, and Dr. D. W. Green, Dayton.

A paper, "Ovariotomy During Pregnancy," was read to Dr. J. E. Sylvester, Wellston, and discussed by Dr. D. T. Gilliam, Columbus; Dr. J. F. Baldwin, Columbus, and Dr. R. B. Hall, Cincinnati.

Dr. R. B. Hall offered a resolution extending the thanks of the Society to the Committee of Arrangements, the local profession and the hotel management for the courtesies extended the Society during the meeting.

With a few remarks by President Humiston, the session was declared closed.

MEDICAL SECTION

Upon motion by Dr. D. N. Kinsman, Dr. Charles Blacker, of South Bloomfield, Ohio, was elected chairman of the Medical Section of the Ohio State Medical Society.

The first paper read before the Medical Section was on "Bilateral Paralysis of the Posterior Crico-Arytenoid Muscles of the Larynx, with Report of a Case," by A. R. Baker, M. D., Cleveland. The paper was discussed by Dr. D. N. Kinsman, Columbus; Dr. P. J. Kline, Portsmouth, and by Dr. Baker in closing.

"A Case of Cirrhosis of the Liver," by P. J. Kline, M. D., Portsmouth. This was discussed by Dr. D. N. Kinsman, of Columbus, and by the essayist in closing.

"The Clinical Importance of the Position of the Stomach" was the title of a paper read by Henry W. Bettman, M. D., Cincinnati. The discussion was participated in by Dr. James U. Barnhill, of Columbus; Dr. M. E. Blackburn, Columbus; Dr. D. N. Kinsman, Columbus, and by Dr. Bettman in closing.

"Intracranial Complications of Aural Disease; Prognosis and Treatment," by Andrew Timberman, M. D., Columbus. Discussed by Dr. F. G. Stueber, Lima; Dr. A. R. Baker, Cleveland; and the discussion closed by the essayist.

The last paper heard by the section was a volunteer contribution on "The Dyspeptic Stomach and How We Can Secure a Speedy Cure," by Dr. J. G. Albers, of Fulda.

CHAPTER II

Reports of Secretary, Treasurer, Committees, State Board, Etc.

SECRETARY'S REPORT

The roll of permanent members of the Ohio State Medical Society, as published in the 1897 transactions, includes 903 names of living members. From this number only five deaths have been reported during the past year: Dr. N. Potter, Adelphi; Dr. J. W. Hamilton, Columbus; Dr. S. W. Ranney, New Albany; Dr. W. W. Hall, Springfield; Dr. John E. Fackler, Versailles. There have been eleven resignations presented to be acted upon by the Society. Two members have removed from the state. Their present address is unknown and the dues unpaid. These deductions leave 884 as our permanent membership. It is probable that a number of men whose names are now on the roll will be dropped for non-payment of dues this year. A slight gain in membership is shown by the net returns.

Most of the auxiliary societies that have so far reported have shown gains in membership. An unusually large number of the auxiliary societies are so far delinquent in their reports. I hope to obtain them by further correspondence for publication in the 1898 transactions. Only two societies so far heard from are moribund—those of Lawrence county and Trumbull county.

What has been done by the Society and the results of the work of your officers will be fully shown in the reports of the other officers and the committees, so that further detail by the Secretary is unnecessary.

TREASURER'S REPORT

Toledo, May 4, 1898

Bro't for'd		$8,681.35	
1893 receipts	$2,074.19		
1894 "	1,596.95		
1895 "	1,868.00		
1896 "	1,628.21—	7,167.35	
1897 "		1,514.00	

SUMMARY

1897 from initiation fees...	280.00		
1897 from members'ip dues	1,234.00—	1,514.00	
Bro't for'd			$8,672.16
1893 expenditures	2,074.19		
1894 "	1,596.95		
1895 "	1,788.09		
1896 "	1,708.12—		7,167.35
1897 "			1,504.81

SUMMARY

Thos. Hubbard, Sec'y, 1896:		
Salary	$125.00	
Printing and stationery....	42.50	
Clerical services	20.00	
Postage	1.00—	$188.50
J. A. Thompson, Sec'y, 1897:		
Printing and stationery	32.90	
Postage	40.50	
Sundries	3.15	
Express charges	.90—	77 45

C. N. Smith, Editor, 1896:			
Salary	100.00—	100.00	
R. Harvey Reed, Editor, 1897:			
Salary, on account	50.00		
Personal expenses	19.95—	69.95	
H. M. W. Moore, Asst. Sec'y:			
Personal expenses	17.25—	17.25	
Jas. A. Duncan, Treasurer:			
Salary	125.00		
Cash advanced	.21		
Surety bond	7.50		
Postage	41.00		
Printing and stationery	16.25		
Freight and exp. charges	91.92—	281.88	
J. J. Noland		25.00	
Stenographic report, convention, 1897		74.80	
Publication transactions, 1897		523.00	
Printing, stationery and engr'gs		68.19	
Expenses Legislative Com.		50.00	
Fees and dues refunded		18.00	
Central Traffic Association		11.00	
Balance cash on hand		8.98—	$1,514.00

Respectfully submitted,

JAMES A. DUNCAN,
Treasurer.

REPORT OF COMMITTEE ON PUBLICATION

Present: Drs. J. C. Oliver, F. D. Bain, P. M. Foshay, with Dr. J. A. Thompson *ex-officio* and Drs. C. F. Hoover and O. T. Maynard appointed *pro-tem.* Dr. J. A. Duncan, Treasurer, was also present. Dr. Foshay was made Secretary.

The contract for printing the 1898 transactions was awarded to J. B. Savage, of Cleveland. In awarding the contract, the committee made the proviso that extra pages should not be charged for at a rate greater than $1.25 per page.

On motion of Dr. Bain it was agreed to require the usual bond of $500 of J. B. Savage to the Society, as a guarantee of fulfillment of the contract.

On motion of Dr. Thompson Dr. P. M. Foshay was elected Editor for 1898.

On motion of Dr. Thompson it was agreed to allow the Editor for 1898 the usual compensation of $100.

Adjourned.

(Signed), P. MAX FOSHAY, Secretary.

REPORT OF SPECIAL COMMITTEE ON NATIONAL LEGISLATION

To the President and Members of the Ohio State Medical Society.

Gentlemen: Your committee on National Legislation, appointed in response to the overture of the New York State Medical Society, has awaited the call of the committee of that society for a meeting in Washington to perfect a National organization, but so far no call has been received. Copies of the resolutions of this society anent the Antivivisection Bill of Senator Gallinger, still pending, were sent by your chairman to Dr. Busey, chairman of the District Committee of the District of Columbia, and likewise to Senators Foraker and Hanna. Your committee received a reply from Senator Foraker and a promise to give your request a favorable consideration, but so far has received no reply from Senator Hanna. The District Committee, however, caused your resolutions to be printed and placed in the hands of every member of the senate. Apparently, if we may judge from the circular letter sent out recently by Dr. Howard Kelly of Baltimore, Senator Gallinger is still obstinate in his determination to override the all-but-unanimous sentiment of the medical profession, and to push the enactment of his mischievous measure into law. But up to this time, owing in no small degree to the efforts of this society, he has not yet succeeded in bringing it to a vote. But the Antivivisectionists are persistent; they have ample means and time at their disposal; they have able and influential advocates resident in Washington, and the medical profession must also have its men on the ground, acting with full authority delegated to them in order to counteract the efforts of the so-called Humane organizations to hamper and hopelessly cripple biologic and physiologic in-

vestigation in the Government laboratories, and in the medical schools of the District of Columbia.

It seemed to your committee last year that the New York plan provided for too large a body—a body which from its very size would prove too unwieldy for prompt and effective work—but the need of a body which shall authoritatively represent the convictions of the organized medical profession upon those matters of legislation regarding which the medical profession alone has the training requisite to speak with proper authority, becomes increasingly evident, and your committee begs leave to submit the following plan of organization for the consideration of this society.

First: That the American Medical Association be requested to appoint a standing committee of three on national legislation, one member to be a resident of Washington, one of Baltimore and one of Philadelphia. A committee so located could be called together at Washington on short notice and appear before the committees of Congress at any time.

Second: That each state society of legally qualified practicians of medicine be requested to appoint a committee of one on national legislation, such committee to keep himself in communication with the senators and representatives from his own state, so that they may be always kept in touch with the medical profession concerning matters of Sanitary and Medical legislation.

Third: That a joint meeting of the committee of the American Medical Association and the committeemen of the several state societies be held in Washington subject to the call of the committee of the American Medical Association. The purpose of that meeting would be to give opportunity for each state committeeman to personally interview the representatives and senators from his own state, and for the committee as a whole or by subcommittees to appear before the various congressional committees to set before them authoritatively the sentiments of the medical

profession regarding pending legislation, and to urge the passage of measures upon which the medical profession of the Nation has already agreed, and to which they have already given support by formal action. Meeting thus on the ground, and consulting together, the members of such a joint committee would moreover become better cognizant of matters upon which the medical profession ought to take action, and by embodying such matters in their annual reports to their respective societies the sentiment of the medical profession as a whole would become promptly and authoritatively declared. We should thus begin to act as a unit in matters of national legislation affecting the sanitary interests of the people as a whole.

Fourth: That the necessary expenses of these committeemen be borne by their respective societies.

In conclusion your committee would recommend the adoption of the following resolutions:

Resolved, 1. That we again enter our earnest protest against senate bill No. 1063, entitled "A Bill for the Further Prevention of Cruelty to Animals in the District of Columbia," for the reason that existing laws amply provide for the prosecution and punishment of any real cruelty to animals which may be proven to occur within the district, and because the physicians and scientists of the district have not so conducted themselves in the past as to warrant the system of irresponsible espionage authorized by the bill, and further, because the paramount interest of the sick and afflicted demands that the medical profession shall have liberty to investigate the nature and treatment of disease free from cumbersome and vexatious restrictions such as are provided in the measure in question.

2. That we again urge upon Congress the necessity of thorough inspection by a medical officer of the United States of all emigrants and their baggage before they embark for this country, in order that the importation of con-

tagious and infectious filth-diseases may be more effectually prevented.

3. That the secretary of this society send a copy of these resolutions to each senator and representative in Congress from Ohio, and of the second resolution to the chairmen of the committees on Commerce and on Immigration of both House and Senate. Respectfully submitted,

L. B. TUCKERMAN
RUFUS B. HALL
A. M. BLEILE
Committee

RUSH MONUMENT FUND

The Chairman of the Rush Monument Fund Committee presents the following report:

A committee consisting of Dr. N. R. Coleman, Columbus; Dr. E. W. Mitchell, Cincinnati; Dr. S. S. Halderman, Portsmouth; Dr. C. N. Smith, Toledo; Dr. William E. Bruner, Cleveland, was appointed by the President of the Ohio State Medical Society to solicit subscriptions throughout the State which was divided into five sections with one of the Committee in charge of the work in each section. In addition to the work done by the individual members of the Committee a circular letter was sent to all the physicians of the State setting forth the object of the Fund and soliciting subscriptions. The following were the receipts:

Through Dr. Coleman from his section of the State:		
Jefferson County	$25 00	
Perry County	13 00	
Dr. N. R. Coleman	5 00	
Dr. W. D. Hamilton	5 00	
Total from Dr. Coleman		$ 48 00
Through Dr. Mitchell from his section of the State:		
Dr. J. S. Caldwell	$ 1 00	
Dr. J. M. Withrow	1 00	
Dr. S. C. Ayers	1 00	

Dr. Robert Sattler	$ 5 00
Dr. J. T. Whittaker	5 00
Dr. B. H. Blair	1 00
Dr. J. H. Buckner	2 00
Dr. J. C. Oliver	5 00
Dr. D. C. Lichliter	1 00
Dr. E. S. Stevens	5 00
Dr. R. C. Belt	1 00
Dr. C. H. Foertmeyer	2 00
Dr. T. J. Casper	1 00
Dr. H. J. Death	1 00
Dr. H. C. Robinson	1 00
Dr. Max Thorner	3 00
Dr. Edwin Ricketts	1 00
Dr. A. Ravogli	5 00
Dr. J. E. Meyers	1 00
Dr. F. F. Hellman	1 00
Dr. A. D. Birchard	1 00
Dr. W. E. Shaw	1 00
Dr. R. T. Trimble	1 00
Dr. T. A. Dickey	1 00
Dr. F. W. Langdon	2 00
Dr. Robert Ingram	2 00
Dr. George Straehley	1 00
Dr. W. D. Porter	2 00
Dr. Thrasher	5 00
Dr. Rufus B. Hall	10 00
Dr. G. H. Highland	1 00
Dr. W. C. Kendig	1 00
Dr. J. L. Cleveland	5 00
Dr. J. S. Caldwell	1 00
Dr. N. I. Fraid	1 00
Dr. O. P. Holt	1 00
Dr. Edward Walker	1 00
Dr. Byron Stanton	2 00
Dr. W. H. DeWitt	5 00
Dr. William Judkins	1 00
Dr. J. C. Culbertson	1 00
Dr. L. J. Krouse	1 00
Dr. F. P. Dorschug	1 00
Dr. E. Schwab	5 00
Dr. A. W. Johnstone	5 00
Dr. Charles L. Bonifield	2 00
Dr. Albert H. Freiberg	3 00
Dr. J. Ransohoff	5 00
Dr. Louis Schwab	5 00
Dr. G. M. Allen	2 00
Dr. H. H. Hoppe	1 00
Dr. F. B. Cross	1 00
Dr. A. L. Atherton	1 00
Dr. C. R. Holmes	5 00
Dr. I. Stark	5 00
Dr. F. Brunning	1 00

Dr. John E. Greiwe	$ 2 00	
Dr. E. E. Sattler	1 00	
Dr. E. G. Zinke	1 00	
Dr. E. W. Mitchell	6 00	
Dr. J. A. Thompson	1 00	
Dr. W. B. Weaver	1 00	
Dr. B. F. Miller	2 00	
Dr. C. W. Tangerman	1 00	
Clark County Medical Society	15 00	
Total		$163 00
Expenses, circulars and envelopes	12 00	
Stamps	15 00	
Total		27 00
Total from Dr. Mitchell		$136 00

Through Dr. Halderman from his section of the State:

Lawrence Co.:

Dr. Gilman R. Davis, Ironton	$ 1 00	
Dr. Wm. E. Pricer "	1 00	
Dr. W. S. Eakman, "	1 00	
Dr. D. R. Alban, "	1 00	
Dr. J. M. White, "	1 00	
Dr. E. E. Wells, "	1 00	
Dr. J. W. Bowry, "	1 00	
Dr. O. B. Dunn, "	1 00	
Dr. D. C. Willson, "	1 00	
Dr. C. G. Gregg, "	1 00	
Dr. N. K. Moxley, "	1 00	
Dr. Lester Keller, "	1 00	
Dr. G. W. Livesay, "	1 00	
Dr. W. L. Giffirth, Pedro	1 00	
Dr. C. W. McCoy, South Point	1 00	
Total		15 00

Scioto Co.:

Dr. J. B. Ray, Jr., Portsmouth	$ 1 00	
Dr. W. M. Lottridge, "	50	
Dr. A. G. Sellards, "	1 00	
Dr. W. W. Smith, "	50	
Dr. P. J. Kline, "	1 00	
Dr. Mary Cotton, "	1 00	
Dr. Will Burgess, "	25	
Dr. Wells Teachnor, Sciotoville	50	
Dr. N. W. Aldermann, Athens	1 00	
Dr. D. A. Berndt, Portsmouth	1 00	
Dr. D. B. Cotton, "	1 00	
Dr. J. S. Rarden, "	50	
Dr. S. S. Halderman, "	1 00	
Total		10 25

Jackson Co.:

Dr. O. McLaughlin, Rempel	$ 1 00	
Dr. U. L. Kinnison, Hillsdale	1 00	
Dr. O. M. Woodrow, Wellston	50	
Dr. G. A. Ewing, Jackson	50	
Dr. W. R. Evans, "	50	
Dr. William E. Williams, Jackson	1 00	
Dr. J. L. Gahm, Jackson	1 00	
Dr. J. F. Morgan, "	2 00	
Total		7 50
Total from Dr. Halderman		$ 32 75

No report was received from Dr. Smith, Toledo, for his section of the State.

Through Dr. Bruner from his section of the State.

Mahoning County (through Dr. Peck, Youngstown):

Dr. G. S. Peck	$ 1 00	
Dr. H. E. Blatt	1 00	
Dr. John McCurdy	1 00	
Dr. R. D. Gibson	50	
Dr. R. H. Montgomery	50	
Dr. J. H. Crooks	50	
Dr. C. D. Houser	50	
Dr. J. S. Zimmermann	50	
Dr. W. P. Love	50	
Dr. J. J. Thomas	50	
Dr. J. E. Cone	50	
Dr. C. C. Booth	50	
Dr. M. S. Clark	50	
Dr. L. V. Howard	50	
Dr. Beech	50	
Total		9 00

Trumbull County:

Through Dr. Sabin		25 00

Medina County (through Dr. Everhard):

Dr. N. S. Everhard, Wadsworth	$ 1 00	
Dr. C. N. Lymann, "	1 00	
Dr. M. F. Miller, "	1 00	
Dr. G. H. Wuchter, "	50	
Dr. C. D. Freeman, Medina	1 00	
Dr. F. S. Jones, "	1 00	
Dr. L. S. Murry, "	1 00	
Dr. W. D. Wise, "	50	
Dr. W. J. Woods, "	50	
Dr. William Bigham, Seville	1 00	
Dr. P. E. Beach, "	1 00	
Dr. J. E. Waite, Lodi	1 00	
Dr. J. J. Wall, Mallet Creek	1 00	
Dr. A. Brintnall, Liverpool	50	
Total		12 00

Lorain County (through Dr. Jameson):		
Dr. W. C. Bunce, Oberlin	1 00	
Dr. C. H. Browning, "	1 00	
Dr. S. E. Leonard, "	1 00	
Dr. Delphine Hanna, "	1 00	
Dr. A. B. Everitt, Kipton	1 00	
Dr. Meriam T. Runyon, Oberlin	1 00	
Dr. G. C. Jameson "	1 00	
Total		7 00
Cleveland:		
Dr. A. F. House	5 00	
Dr. W. E. Wirt	5 00	
Dr. M. Rosenwasser	5 00	
Dr. H. S. Straight	5 00	
Dr. T. C. Martin	5 00	
Dr. J. H. Belt	1 00	
Dr. J. B. McGee	1 00	
Dr. F. C. Taylor	1 00	
Dr. J. V. Kofron	1 00	
Dr. Charles Gentsch	2 00	
Dr. I. Friedman	1 00	
Dr. H. L. Spence	1 00	
Dr. C. F. Hoover	2 00	
Dr. C. A. Hamann	1 00	
Dr. G. A. Orwig	1 00	
Dr. H. S. Upson	1 00	
Dr. H. C. Bliss	1 00	
Dr. W. E. Lower	1 00	
Dr. B. Oettinger	1 00	
Dr. W. A. Knowlton	1 00	
Dr. N. Stone Scott	2 00	
Dr. J. E. Cook	1 00	
Dr. O. T. Thomas	1 00	
Dr. W. H. Humiston	10 00	
Dr. H. B. Ormsby	1 00	
Dr. W. E. Bruner	2 00	
Total	$59 00	
Expenses, postage, etc.	2 00	
Total balance		57 00
Total from Dr. Bruner		$110 00

Cash received at the meeting of the Ohio State Medical Society in May:

Dr. J. E. Berry	$ 50
Dr. Berry	50
Dr. C. D. Mills	50
Dr. J. D. Smith	50
Dr. O. Hasencamp	50
Dr. A. J. Reycraft	50

Dr. N. C. Miller	50
Dr. D. M. Smith	50
Dr. H. B. Gibbons	50
Dr. H. F. ———	50
Dr. R. R. Pettit	2 00
Dr. E. F. Wilson	1 00
Dr. Hannell	25
Dr. F. C. Larimore	5 00
Dr. J. E. Brown	1 00
Dr. W. R. Thompson	1 00
Dr. M. J. Finley	1 00
Dr. S. Leach	1 00
Dr. D. J. Merriman	50
Dr. L. Woodruff	50
Dr. W. M. Hoover	50
Dr. J. G. Albers	1 00
Dr. A. H. Wallace	50
Dr. E. C. Voltz	50
Dr. T. M. Wright	1 00
Dr. Fitzsimmons	50
Dr. Z. T. Guerin	50
Dr. S. H. Chaney	50
Dr. D. H. Young	50
Dr. A. M. Craig	50
Dr. N. S. Scott	50
Dr. A. B. Howard	50
Dr. G. E. Robins	50
Dr. J. F. Fox	50
Dr. R. S. Barton	25
Dr. C. E. Kimmerline	50
Dr. J. H. Huntly	50
Dr. D. R. Silver	2 00
Dr. A. B. Walker	2 00
Dr. C. F. Clark	1 00
Dr. D. E. Spahr	25
Dr. C. L. Dine	1 00
Cash	25
Dr. L. C. Anderson	1 00
Dr. William McEntyre	50
Dr. A. M. Duncan	1 00
Dr. N. P. Davidson	1 00
Dr. C. E. Beardsley	1 00
Dr. W. C. Denman	1 00
Dr. Price Moody	75
Dr. L. F. Landeck	50
Dr. S. B. Lusk	50
Dr. W. S. Scurlock	50
Dr. J. C. Haney	50
Dr. J. U. Barnhill	1 00
Dr. F. G. Stueber	50
Dr. J. O. Southard	1 00
Dr. J. Z. Heskind	1 00
Cash	25

Cash.	50	
Cash.	50	
Cash.	1 00	
Dr. L. E. Niles	1 00	
Dr. C. E. Blacker	50	
Dr. A. F. Holmes	50	
Dr. Joseph Sager	50	
Dr. Milo Wilson	50	
Dr. E. G. Carpenter	50	
Dr. Miller	1 00	
Total		$ 52 50

SUMMARY

Received through Dr. Coleman	$ 48 00
Received through Dr. Mitchell	136 00
Received through Dr. Halderman	32 75
Received through Dr. Bruner	110 00
Received at State Society meeting	52 50
Total	$379 25

Of this amount $336.25 was received prior to the meeting of the American Medical Association at Denver and was paid over to the proper authorities through our President, Dr. Humiston, at that time. The balance, $43.00 I still have on hand ready to be paid over at any time.

Respectfully submitted,

WILLIAM E. BRUNER, M. D.
Chairman Rush Monument Fund Committee

A COMMUNICATION FROM THE OHIO STATE BOARD OF MEDICAL REGISTRATION AND EXAMINATION

BY N. R. COLEMAN, M. D., COLUMBUS, PRESIDENT OF THE BOARD

Gentlemen of the Ohio State Medical Soceity: This Society has been largely instrumental in causing the enactment of the law which is now in force for the regulation of the practice of medicine in this state. Therefore, it is befitting that a report be made once a year in order that the members thereof may be apprised of the work accomplished by the State Board of Medical Registration and Examination, and the difficulties it has encountered in administering the law. A report was made one year ago at Cleveland, by my very efficient and highly esteemed colleague, Dr. Charles A. L. Reed, of the preliminary work in organizing the Board and the work accomplished up to that time. Hence, in this report, I shall simply submit a summary of the work from the time the law went into effect up to the present and enumerate some of the difficulties encountered.

There have been two reports issued: the first one contains the official work of the Board from the time the law went into effect, February 27, 1896, until January 10, 1897; the other from the period last mentioned until January 1, 1898. I trust that all have had an opportunity to examine the reports, and that each member of this organization has in his possession copies of the same. If not, we would be glad to furnish them.

There have been issued up to May 1, 1898, to graduates in medicine 7,863 certificates; to legal practicians, 708; by examination, 13; total number, 8,584. To midwives have been issued by the Probate Judges of the several counties 281 certificates; by examination, 13; total number, 294. The number of applications rejected during the above

period has been: graduates, 129; legal practicians, 211; on examination, 15; a total number of 355. The number of certificates revoked, 3. The number of cases appealed to the Governor and Attorney General, under Section 4403c of the law, 5, in all of which the Board has been sustained. The number of prosecutions has been, of cases convicted, 23; cases acquitted, 7; cases in which grand jury failed to indict, 5; cases pending, 47; total, 82.

It is impossible to state the number of certificates now in force in the State, on account of the inability to obtain the number of deaths that have occurred since the passage of the law, and the number of removals up to this time. The law provides that the Probate Judges shall make a report of all the deaths and all removals, on or before December 31 of each year, which they have expressed a perfect willingness to do; but they are unable to obtain the necessary information, as there is no provision whereby they can be informed of either deaths or removals. It is not a defect in the law, as such work does not come within the purview of this act. There is but one way by which this information can be obtained, and that is by the county medical societies appointing a committee of one or more to make such reports to the Probate Judge of their respective county; and this, I think, should be done by the societies of every county in this State. It will not be attended with any real expense, and will enable the Board to determine at the end of each year the exact number of certificates in force.

EXPENDITURES

In the reports issued by the Board can be found an itemized statement of expenses up to December 31, 1897. In justice to the physicians of the State and to the Board, it may be proper to make some explanation of the statements found in the reports.

When the Board organized, it found itself confronted with the fact that it had absolutely nothing with which to

carry out the provisions of the law. Furniture, books, blanks, stationery, file-cases, etc., had to be provided. It was deemed necessary that a vault be provided in which to securely file all valuable records of the office. As the work had to be accomplished in such a short space of time, the clerical services were necessarily large, requiring some eight clerks besides the Secretary, Assistant Secretary, Stenographer, President and Treasurer. The engrossing had to be done by those skilled with a pen, consequently their services were expensive. In order to facilitate the work, the Secretary visited all the larger cities of the State, and, assisted by two physicians of a given locality, received the applications for registration. The steel plates for printing the certificates were quite expensive. A large number of certificates had to be printed, and the paper for the same having to be made on a special order, their expense was materially increased. The issuing of the reports was attended with considerable expenditure from the fact that there were nearly 8,000 names which had to be printed in the county list and again in the index. This class of work is extremely tedious. The proof has to be read two or three times and compared with the records, all of which requires much time and good clerical services, which cannot be secured without a fair compensation. The money paid for legal services is one of the largest items of expenditure, and has been cut down in every possible way, and to the fullest possible extent compatible with the efficient enforcement of the law. It was absolutely necessary to secure the services of attorneys possessing ability and experience, in order that the law might not be defeated by those opposing it, who were nearly always defended by the very best of counsel. You are fully aware that good attorneys demand liberal compensation for their services; but the Board believes that at no time have the attorneys' fees been excessive, in fact being lower than those paid by other departments of the State for like services. The efficiency of

their work has been fully attested by the result of the numerous cases tried and convictions obtained. In order to secure evidence which is necessary and not otherwise to be obtained, in some cases, the attorneys have to travel long distances, being away as much as two weeks at a time and during which their expenses must be defrayed by the Board.

During the first year after the law went into effect the Board had to hold many sessions, and at times it was necessary to prolong them three or four days to dispatch accumulated business. The Board, accompanied by their attorney, had to visit Cincinnati to investigate some so-called medical colleges in that city, the expenses of which included four days' time, the employment of a stenographer, the payment of witnesses, copying of testimony, etc.

It was necessary for the Board to visit several other points in the State, in order to examine the condition of the medical colleges and attend to other matters devolving upon them. The work of the President of the Board was required almost continuously for the first four or five months, to attend to the correspondence, sign certificates, and to perform other duties which were incumbent upon him.

The Treasurer had to devote almost his entire time to the financial department for a like period. During this time each of these officers had to employ special clerical assistance to dispatch the work of their departments. The entire amount of money paid the Board during the first year, including *per diem* and all expenses, amounted to $4,061.93.

The work of the Board has not been so onerous during the past year, there having been but few extra meetings, consequently the amount received by its members is much less, only amounting to $1,287.13. In concluding my statements relative to the expenses, permit me to state that the Board has endeavored to the best of its ability to economize in every way possible which was compatible with the efficient administration of the law.

INVESTIGATIONS BY THE BOARD

In order that you may more fully comprehend the magnitude of the work the State Board has performed, permit me to state that the report of the Commissioner of Education, for 1895 and 1896, shows the existence of 151 medical schools in the United States, having in attendance 24,437 students. In our own State there are 13 medical colleges, 12 of which confer the doctorate degree, having in attendance, during the term of 1897-'98, 1,540 students, of whom 509 are applicants for graduation. You must take into consideration that the Board may have to examine into the standing of any one of the 151 medical colleges, and not only to determine the present but the past standing, and to determine if there has been any period during the existence of a given college in which its work has not been up to the requirements of the Board; and, if so, to determine the exact date of such defect in teaching, equipment or standing. Then again, there are a large number of colleges that are defunct; and when an applicant who was a graduate of such school presents an application, it must be determined what was the standing of that school during its existence and what became of it, tracing it through its entire history, and also whether it was consolidated with or merged into some other school. In many cases the name has been changed, giving rise to an immense amount of correspondence and gathering of records in order to establish the fact that the applicant in question is entitled to registration.

Not only is this true of the colleges in our own country, but we have to deal with quite a number of applicants who received their degrees in foreign countries. Such schools have to be investigated and all the facts learned relative to their standing, and in such cases the applicant is required to get transcripts and affidavits showing that he received a degree from the alleged college and that he is the rightful owner of the same. Blanks have to be sent to the United States Consul of the country in which such colleges are

located, and an investigation made, a blank filled out and then transmitted to the Board in official form. All this requires an immense amount of labor, and in many cases a number of months must elapse before such information can be obtained.

The above statement is a mere outline, but it is sufficient to give you at least a vague idea of what the Board has to contend with. In all cases where there are protests filed against an application, the applicant is notified that charges have been filed, and informed that it will be necessary for him to appear before the Board, either in person or by attorney, and that an opportunity will be given for him to be heard fully and fairly in his own behalf. A number of cases have been thus contested; and hours and days have to be spent over them. They are conducted in the regular order of investigations and trials in court. Shrewd and well-educated attorneys are employed by such contestants, and the Board has to listen to the reading of a large number of affidavits, sometimes amounting to fifty or more. Long petitions are read, followed, perhaps, by hours of pleading from the attorneys on both sides. After this is through the Board has to take the case under advisement and by a thorough investigation of all the testimony filed on both sides, and of all verbal testimony taken down by the stenographer, pass upon its merits.

Doubtless the Board has issued certificates to those who are not entitled to them, but not through any fault or neglect on its part. The fault is due to those who filed the affidavits, setting forth that the applicant in question is entitled to all the rights and privileges granted by the law, and we regret exceedingly to state that many such affidavits are filed by physicians. We have granted certificates when we were quite confident that those to whom we granted them were not competent or qualified to take the great responsibility of caring for the sick; yet we were powerless from the fact that they had affidavits, sustaining their applications,

filed by men whose honor should be beyond question, and we had not a single bit of evidence filed against them. Under such circumstances the Board could do nothing but issue the certificate and thereby sanction and legalize one evil that we seek to eradicate. I ask you, in all fairness, who was to blame? Surely not the Board, because the Board would gladly have rejected all such applicants; but, if the facts were known, either through selfish motives, negligence or cowardice they were not presented.

Allow me to cite one case, to illustrate what I have just said. An application was made for a certificate, accompanied by three affidavits made in due form by men who had received their certificates. There was not a single protest or anything to intimate that the case was not clear and correct. Of course the Board had no right, under such circumstances, to doubt the truthfulness of such affidavits. Therefore, a certificate was issued. In the course of two or three months word was received by the Secretary, stating that there was doubt of the justice of issuing a certificate in this given case, with a request from high authority that the matter be investigated at once. The Secretary repaired to the place, armed with the affidavits filed to support such application. The first physician visited, and who had made affidavit, when interrogated by the Secretary relative to it, said he did not like the law or the Board; that he knew very well that the individual in question was not now, and never had been, a physician, using language not in keeping with the best moral code or fit to use in this report. The second one visited said that he had never read the affidavit, and that he was "an old fool" (with which we perfectly agreed), and signed all papers that were brought to him. The third one said that he *believed* the individual had been in practice ten years, but his acquaintance with such applicant only extended over a period of three years.

Now, I ask you again, whose fault was it that the certificate was issued in this case? The above facts being ob-

tained, the Secretary thereupon notified the holder of said certificate to appear before the Board and show cause why the certificate should not be revoked, which was responded to promptly and without any resistance.

I might go on and enumerate a number of cases of a similar nature, but time will not permit it nor would it be of any advantage. I do not wish to be understood as criticising any particular physician within the State, but when physicians knowingly and wantonly make affidavit, swearing to the good moral character of an unworthy person, to his ability to discharge his duties as a physician, and that they believe him to be legally entitled to receive recognition under the law, I believe they surely make a grave error, if they do not commit a criminal offense.

There is another class of individuals which has given the physicians of the State an immense amount of annoyance; and in their relation to the same, the members of the Board have been the subject of much criticism which is unwarrantable and which would not be indulged in if those making such criticism would take time to read and study the law more thoroughly; and that is the class of those, who, claiming that they do not prescribe, go around from place to place and vend their nostrums upon the suffering and credulous public, which is ever ready to patronize them. These persons resort to various methods to evade the law, and particularly Section 4403f, which defines the practice of medicine; and I may here be permitted to state that this section is defective in that it is not broad and explicit enough to meet all the various plans resorted to by those designing persons who impose upon the public. They attempt to evade the law by putting up their medicine in a package with the price and label upon it, and claim that they are not prescribing it or charging a fee, but only are charging for the intrinsic value of the medicine. Various forms of useless nostrums are put up in this way and sold for a price a thousand times more than their real cost, yet the courts

have not decided that the excess of charge above the real commercial value is a fee. Such individuals further impose upon the public by using the letters *Dr.* before their names, or *Professor*, and various such devices and titles which are calculated to mislead and deceive. Our earnest desire is that some remedy for this evil may be suggested by this wise and honorable body.

THE ONLY WAY IN WHICH THE LAW CAN BE ENFORCED

The only way in which the law can be efficiently, promptly and satisfactorily administered is through the hearty cooperation of the physicians throughout the entire State. The Secretary is looked upon by many as the only individual who is responsible for the thorough carrying out of the law. Such an idea is erroneous. He is neither omniscient nor ubiquitous. Therefore, it is utterly impossible for such an officer to know what is going on in all parts of the State. He and all the members of the Board are perfectly willing and ready at all times to render any possible aid within their power. Many times reports are received that the law is being violated, without giving either the name of the offender, the offense committed, or the character or date of the same; and accompanying the report is the earnest request that no one be allowed to know who made the complaint. This is sheer cowardice. You cannot enforce a law by that method. Why ask that the name be withheld? You have the law on your side and nothing to fear. At times there is a faint suspicion that such complaints are sent in through selfish motives or jealousy. When such is found to be the case you cannot expect that the Board will be a party to such conduct, or that they will lend their hand in harming an honest competitor. More than one such case has been brought to the attention of the Board, and bitterly contested upon both sides; but, when the true status of the case was determined, it was promptly dismissed. There was one case that persisted for months in bringing charges

before the Board until it became unbearable, and I took occasion to say to one of the contestants that I had but one word of suggestion—that he and his adversary repair to a quiet hill-side and close the matter up. The idea seemed to meet his approval. A few days later the Secretary received a very polite request to return all papers filed upon both sides.

I could enumerate other cases, but it is unnecessary. If the physicians in each county will appoint a committee, whose duty it is to report to the Secretary of the Board all infractions or suspected infractions of the law, and the physicians throughout the county will report to such committee promptly and diligently, giving their hearty support and co-operation, then, and then only, can the law be efficiently administered. Toledo and Akron have such organizations, and they have accomplished good results, and to them great credit is due.

Permit me to suggest that within the next three months every county within the State follows their example and appoints such a committee, and through them let all infractions of the law be reported to the Secretary of the State Board of Medical Registration and Examination, as provided by law. You are well aware that the law provides that one-third of all fines collected shall go to the individual, society, or incorporation giving the information that leads to conviction.

WHAT THE LAW HAS ACCOMPLISHED

When the law regulating the practice of medicine in this State went into effect, it is probable that no equal territory contained so many vampires, charlatans, mountebanks and quacks as did Ohio; and the more the law was enforced the more did this class of individuals come to the surface. There have been 355 certificates rejected by the Board; and, approximately estimated, not less than 700 caused to leave the State or cease to practice. Four so-

called medical colleges have been compelled to close their doors, or practically cease to do business. They were a stain and a disgrace to the good name of the State, and veritable diploma-mills, having no equipment, either in faculties, buildings, or facilities, to discharge the responsible duty of educating men to care for the sick and afflicted. Why such institutions were allowed to exist by an enlightened community is a matter hard to explain. Efficient laws have been in force for years, and yet these institutions had gone on in their infamy unmolested.

It might be well to call your attention to the fact that there are twenty-nine states in the Union which require an examination of all who enter upon the practice of medicine in such states. A diploma will not admit them to practice, only renders them eligible to apply for an examination. These states reject a certain percentage of the applicants, who must seek some other location, and a large number of them find their way to our own lovely and wealthy State to apply for permission to practice their profession. They are graduates of colleges recognized by the Board, and no complaints being filed, the Board has but one alternative, and that is to issue a certificate. This class of men does not tend to elevate or render more efficient the medical service of the State, which is the intent of our present legislation.

This matter should receive our very careful consideration to see if some remedy cannot be found. The present condition works a great hardship, and particularly upon the young, well-qualified physician, by filling up the State with a class of men who are incompetent and, having no other place to go, must eke out an existence by hook or by crook.

Through the influence of the various medical societies and of the law, the medical colleges of the State have increased their facilities and are much better equipped to give good medical training at the present time than they were two years ago. More interest has been manifested in the medical societies, and new ones have been formed in various

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parts of the State. The laws passed in the several states have been among the chief factors in causing the phenomenal advance in medical education which has been effected during the past few years. The time of study was advanced from two to three years, and again from three to four; and accompanying those advances were a remarkable widening of the field of study and notable increase in the faculties and equipments of medical colleges, thereby enabling them to impart to students a more thorough knowledge of medical science. As a result of these influences there has been evolved the National Confederation of State Medical Examining and Licensing Boards—a body which, though young, has accomplished much good work, and now has under consideration the establishment of a uniform standard of requirements for students entering medical colleges. It is hoped that this will lead, ultimately, to a uniformity in medical education and in laws regulating the practice of medicine in the several states, and render reciprocity feasible, thereby allowing physicians, who so desire, to move from one state to another without let or hindrance.

APPEALS TO THE GOVERNOR AND ATTORNEY GENERAL

Under Section 4403c of the law, the Board is empowered to refuse a certificate to any person guilty of felony or gross immorality, or addicted to the liquor or drug habit to such a degree as to render him unfit to practice medicine or surgery; and may after notice and hearing, revoke a certificate for like cause. It further provides that an appeal may be taken from the action of the Board refusing to grant, or revoking, a certificate for such cause, to the governor and attorney general; and their decision, either affirming or overruling the action of the State Board, shall be final. This provision is one of the strongest and most important features of the entire law, and has enabled the Board to accomplish some of its most important work. There have been but five cases, in which certificates have been refused

or revoked, that have appealed to the above-named officials.

The cases that have appealed to the Governor and Attorney-general have received their most earnest and conscientious attention. They have spared neither time nor pains to go through volumes of papers and testimony, requiring of them hours and in some cases days, manifesting but one high desire, and that to render an opinion just, logical, legal and honorable.

LEGAL STATUS OF THE LAW

The case of the State of Ohio *vs.* Edson France, having passed through all the lower courts, finally reached the Supreme Court and carried with it questions of vital importance to the physicians of the State. And I am pleased to report that on the 8th day of October, 1897, a hearing was had before the Supreme Court involving the constitutionality of the law, which was most ably, determinedly and skillfully defended by Honorable J. K. Richards, attorney for the Board. In due time an opinion was handed down by that honorable body, pronouncing the law constitutional in all its parts, which was exceedingly gratifying to all honest and law-loving physicians. Since this time there have been fewer violations of the law, and it has been much easier to enforce its enactments.

CHAPTER III

ADDRESSES

PRESIDENT'S ADDRESS

OHIO STATE MEDICAL SOCIETY, DELIVERED BY

WM. H. HUMISTON, M. D., CLEVELAND

My first desire is to thank the Society for the honor conferred upon me in electing me your president for the past year. I have felt the responsibility and I have endeavored to merit the confidence you reposed in me by a faithful performance of the duties that devolve upon this office. After much time spent in thinking over the question of a title for my address I concluded to ignore the usual custom of discussing a scientific topic, and ask your attention only for a very short time while I touch on matters directly pertaining to the welfare and usefulness of our Society.

The aim of our Society should be to do good work. A few papers carefully prepared and freely discussed would be far preferable to a long program which, in order to be completed, would require the full time allotted to the meeting, and render a wide discussion impossible. As a rule the discussion is of more value to the rank and file of the profession than is the paper alone. In order to provide time for discussion it would seem wise to your presiding officer to have the routine business of the Society passed upon by a good-sized representative executive committee, whose report should come before the Society for adoption. Any subject of general interest should be referred by this committee to the society for general discussion and action. At the opening session I asked for authority to appoint a

committee to act in this capacity during this meeting, and you graciously complied. I believe you have been convinced of its desirability, as we have had more discussion of papers than is usual. I trust this method may be continued.

Several state societies at their annual meetings divide themselves into sections, usually a medical and a surgical section, in order to economize time, permitting more full and more free discussion of papers and cases. The plan works well wherever tried, as members experience little difficulty in making a choice as to which section they wish to attend at a given time. Few are, or can be, interested in all papers read at a meeting, and the grouping of them permits of free choice, fuller discussion and more satisfaction to the author. This is a matter which might well be left to the judgment and recommendation of the Executive Committee each year, their action being determined by the length and character of the program.

In this great state of Ohio we have about six thousand regular physicians, and but eight hundred and sixty-five of this number are members of the State Society. This is not as it should be, and it suggests the appointment of a standing committee on "Growth and Prosperity," which action I earnestly recommend. I believe it possible for an active committee within the next two years to increase our membership twelve hundred, making a total of two thousand members.

The receipts of the Treasurer for the past four years have averaged about eighteen hundred dollars per year. With two thousand members our annual receipts would be four thousand dollars, a sum that would permit us to do many things that are necessary, but which with our present membership cannot be entertained. The annual dues should remain at two dollars, and the Transactions will be well worth this amount. With the admission fee at three dollars and the annual dues at two dollars it makes a sum of five dollars, payable at once, necessary in order to qualify

for membership. This puts a premium against an increase in membership and is too great a burden for the rank and file of the profession, and I would respectfully recommend that the by-laws be so changed as to make the admission fee one dollar ($1.00). This will aid the Committee on Growth and Prosperity in their work of increasing our membership to the two thousand mark, after reaching which our receipts will be averaging four thousand dollars per year, giving us an ample fund for increasing the usefulness of the society.

There are eighty-eight counties in the State, and we should have a medical society in each, that would be auxiliary to this body. Instead we have at present less than fifty distinct county medical societies that are now auxiliary bodies. Indiana has an organization in every county and a total membership of 1900 in her State Society. In furthering state legislation along desirable lines no more potent influence could be desired than an active organization in every county of the State that would pledge the prospective candidates for legislative office to a policy that would protect the citizens of this commonwealth from the illiterate and the charlatans.

Every county society should have a Committee on Legislation that would work in conjunction with the State Committee, and thereby make our influence felt along the line, for desirable changes or additions to the law now in force "To Regulate the Practice of Medicine in the State of Ohio," passed February 27, 1896.

And while touching upon matters of state legislation I wish to call your attention to the necessity for well-organized influential representation of our profession to look after our interests in Washington. You are conversant with the danger that threatens us from the attempt made by Senator Gallinger to prohibit vivisection, which if passed will check, if not entirely prevent in the District of Columbia, animal experimentation which is so vital to the progress of scientific

medicine. The pig-stickers and beef-killers, from the country butcher who cuts the throat of but one beef or hog a week, to the great Armour or Swift corporations who kill thousands of animals daily without any attempt to do it painlessly, are to be left undisturbed, while the scientific laboratory worker, who is devoting his time and energies and means to the alleviation of human suffering and the prolongation of human life, is harassed by the misguided efforts of false humanitarians. I should like to have the Ohio State Medical Society take this matter in hand, and at the coming meeting of the American Medical Association inaugurate a plan to have each state send a representative to Washington for one week each year, and there organize for effectual work. Have the American Medical Association appoint three men, one each from Washington, Baltimore and Philadelphia to represent it in this delegate body and to continue the work laid out and agreed upon in the convention of assembled delegates. Each representative could make a personal appeal to the congressmen and senators from his state, and, backed as he would be by the entire profession in his state society, would have an influence that would be effective. In making the suggestion that the American Medical Association appoint her representatives from Washington, Baltimore and Philadelphia, it is for the reason that these delegates would be within easy reach of the capitol and could assemble there readily on short notice and take care of important matters as they come up. Let Ohio be active in promoting and securing this desirable national organization.

I desire also to call your attention to the Rush Monument Fund which has been so long discussed, and in raising which until now so little has been accomplished. Beginning to feel that the apathy of the physicians to this project was becoming a disgrace to the profession, the American Medical Association, at its last annual meeting, made a special effort to stir up interest and enthusiasm. As a result a con-

siderable number of individual subscriptions of $100 each were made and a number of state societies, through their representatives, were pledged to raise $2,000 each before the next meeting of the Association in Denver. The President of our State Society pledged Ohio for that amount. Colorado and New York have already raised their $2,000; other states are actively at work, and certainly Ohio must do her part. Every physician in the state should therefore feel it incumbent upon him to do something that our state may be to the forefront in the amount of contribution toward this fund. Let everyone give something, however small the amount.

In conclusion let me request that each member here present return to his home with the determination to do active work in his county in securing desirable members for our worthy organization, and make the coming year a notable one in the history of the Ohio State Medical Society.

ADDRESS IN SURGERY

THE ETIOLOGY, PATHOLOGY AND DIAGNOSIS OF INTESTINAL TUBERCULOSIS

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Renewed interest has been awakened in the subject of intestinal tuberculosis since recent experience in modern aggressive surgery has taught the profession that some of the cases in which the disease occurs as a primary affection are amenable to successful surgical intervention. Intestinal tuberculosis appears under so many different pathologic forms and presents such various clinical aspects, that it becomes necessary to inquire carefully into its etiology and pathology, in order to enable the surgeon to ex-

ercise the necessary care in the selection of cases for operative treatment. The field of abdominal surgery is rapidly increasing in extent and usefulness, and one of its most recent acquisitions is the successful treatment of certain forms of intestinal tuberculosis.

It is my intention, on this occasion, to discuss as briefly as possible the etiology, pathology, symptoms and diagnosis of this affection of the intestinal canal, with special reference to the indications which dictate and warrant surgical interference.

Frequency of intestinal tuberculosis.—Intestinal tuberculosis is a very common complication of pulmonary and miliary tuberculosis. It is not often met with as a primary affection. In one thousand tubercular subjects examined postmortem in the Pathological Institute at Munich between the years 1886 and 1890, only one case of primary intestinal tuberculosis was noted, while in 566 cases secondary intestinal tuberculosis was seen.

That the disease occasionally occurs as a primary affection can no longer be doubted; the results of an enormous clinical experience and thousands of necropsies furnish a substantial verification of this fact. There can, however, be but little doubt that in many cases of tuberculosis of the intestine in which the clinical features point only to this organ as the sole seat of disease, careful search would reveal old, perhaps latent tubercular foci in some other part of the body. The prudent surgeon selects for his operative work only the cases in which he has reason to believe, from the clinical history and the signs and symptoms presented, that the disease is limited and confined largely if not entirely to the intestinal canal.

Tuberculosis of the stomach.—As primary intestinal tuberculosis is for the most part a feeding disease, it is interesting to know whether or not the stomach is ever the seat of tubercular infection. For good reasons we have for a long time assigned to the gastric juice a destructive, or

at least an inhibitory effect on pathogenic bacteria, but the results of experimentation and clinical observations seem to combine in proving that the virulence of the bacillus of tuberculosis is little, if any, impaired on its way through the stomach. It is natural to assume that in cases in which the physiologic activity of the glandular appendages of the stomach is lessened, the antiseptic properties of the gastric secretions would be correspondingly diminished. The correctness of this statement is borne out by the experience of many reliable clinicians and by the results of experimentation on the lower animals. Blumer (*Albany Medical Annals*, March, 1898,) reports a case of tuberculosis of the stomach in which he found postmortem an old caseous area at the apex of the right lung which had softened at the lower part, general miliary tuberculosis, tuberculous ulcers of the stomach and ileum, tuberculosis of the kidneys and of the aorta. The stomach lesion consisted of three or four small, shallow, circular ulcerations, and near there, numerous miliary tubercles. Blumer has studied the literature of the subject and finds but thirty cases on record, in all of which the gastric lesion was secondary to tuberculosis elsewhere. He divides the reported cases into miliary tuberculosis, and single and multiple ulcerations. Four were cases of pure miliary tuberculosis of the stomach wall; about eight were single and the remainder multiple ulcers.

Tuberculosis of the stomach usually occurs only in connection with similar affections of other organs, especially the intestinal and lymphatic glands. The ulcers are pale and have thickened edematous edges. The inflammatory product presents the usual evidences of the nature of the disease—giant-cells, bacilli and perhaps cheesy material. The disease in this locality presents no characteristic symptoms. Perforation and hemorrhage may occur under the same circumstances as in intestinal tuberculosis. The ulcer presents a sharp contrast to its dark-colored surroundings. In a few cases the serous coat over the floor of the ulcer is

studded with miliary tubercles. In Litten's case the tuberculosis of the digestive tract was limited to the stomach. Similar cases have been described by Talamon-Balzer, Gilles and Eppinger. Musser ("Tubercular Ulcer of the Stomach," *Philadelphia Hospital Reports*, Vol. i, p. 117), found a tubercular ulcer of the stomach one and one-half by three and one-half inches on postmortem examination of a patient who had died of pulmonary tuberculosis. Tubercle bacilli were found in the cheesy material. Most of the cases of tubercular ulcer of the stomach have been observed in children. The disease presents no characteristic symptoms. Musser claims that death in these cases often results from hemorrhage.

Tuberculosis of the stomach is a very rare affection, as is shown by the researches of Letorey *(These de Paris,* 1895), who was able to find an account of only twenty-one cases. This rarity is explained, to a certain extent, by the well-known action of the gastric juice on the *bacillus tuberculosis,* which either dies or loses its virulence in an acid medium. Absence or diminution of hydrochloric acid would therefore favor the development of tubercular lesions, as would also other affections which impaired the digestive functions of the stomach. Letorey believes that the bacillus reaches the stomach more frequently by the way of the circulation than by entrance with infected food. The disease is more frequently demonstrated in the necropsy room than at the bedside. The usual site of the ulceration is near the pylorus and on the larger curvature. In only six cases out of the twenty-one was more than one tubercular ulcer noted, so that the lesion may be said to be generally single, the ulcer round or oval, with ragged and bleeding edges and a grayish-yellow floor. The ulcer occasionally reaches a diameter of from 3 to 5 centimeters. The prognosis in these cases is grave, since the patient usually dies from the effects of the primary pulmonary affection or tuberculosis of other organs, the gastric complication perhaps hasten-

ing the fatal termination. The occasional occurrence of tubercular gastritis is the best possible proof that the bacillus of tuberculosis may pass through the stomach, subjected to the action of the gastric juice, and still retain sufficient virulence on its entrance into the intestinal canal to exercise its specific pathogenic action upon the tissues prepared for its reception and multiplication by hereditary or acquired predisposing causes.

Etiology.—Primary tuberculosis of the intestinal canal is the result of infection from without by the ingestion of food contaminated with the essential cause of the disease, the bacillus of tuberculosis, usually in the form of tubercular milk and meat. The secondary form is caused by autoinfection by the entrance of tubercular sputa into the intestinal canal. The lymph-follicles and Peyer's patches furnish the most favorable anatomic conditions for the localization and growth of the tubercle bacillus. Klebs believes that the introduction into the intestinal canal by the swallowing of sputa in phthisical patients is a frequent cause of intestinal tuberculosis. He discovered two tubercular ulcers in the stomach of a patient who had died of pulmonary tuberculosis. The supposition that intestinal tuberculosis is often caused by the ingestion of tubercular food or sputa is supported by the experiments of Malin, Parrot and Bonley, who found that animals fed with the expectorations of consumptives died of tuberculosis; while Chauveau, Bollinger and others succeeded in producing intestinal tuberculosis by feeding animals susceptible to the disease with fragments of tubercular lungs or with raw tubercular meat. The experiments of Gerlach, Zürn and Klebs demonstrated the dangers attending the use of milk from tubercular cows. In these experiments it was noted that the disease commenced in the form of an intestinal catarrh, and that the extension of the tubercular infection began through the mesenteric glands before the development of diffuse miliary tuberculosis. W. Zinn (*"Ein Fall von Futterungstuber-*

culose bei einem erwachsenen Menschen, mit Ausgang in Miliartuberculose," Munch. Med. Wochenschrift, 1895, No. 37) observed a man 29 years of age who in the course of nine weeks died of acute miliary tuberculosis. The necropsy showed that the miliary tuberculosis had its origin in a mass of caseous tubercular mesenteric glands. No other old tubercular deposit could be found. In the intestine, at a point corresponding to the diseased glands, was found the scar which followed the healing of a tubercular ulcer. The ulcer was evidently the primary lesion which led to tubercular lymphadenitis, and finally death followed from reinfection of the body from the tubercular glands, long after the intestinal ulcer had healed. General infection in this case took place through the thoracic duct. Wyss *("Zur Kasuistik der primären Darmtuberkulose im Kindesalter." Correspondenzblatt f. Schweizerärzte,* 1893, No. 22) found in seventy-one postmortems on children three instances of undoubted primary intestinal tuberculosis. In one case, a girl 5¾ years old who had died of diphtheria, a solitary tubercular ulcer was found in the ileum with extensive tuberculosis of the mesenteric glands. No trace of tuberculosis could be detected in any other organ. Upon inquiry it was ascertained that the child had been fed on milk almost exclusively for some time before she contracted diphtheria. In the other two cases the disease could be traced to the same cause.

Intestinal tuberculosis is found most frequently in children and young adults, although no age is entirely exempt. In the language of Virchow: "the predisposition to tuberculosis, the hereditary vulnerability resides in the tissues, and that the younger and more incompletely developed these are, the more readily will the vulnerability manifest itself in the presence of exciting causes." This may explain the special frequency of intestinal tuberculosis in children and in subjects affected by antecedent inflammatory affections of the intestinal mucous membrane.

Baumers *("Recherches sur la maladie propre aux enfants")* first called attention to intestinal tuberculosis in children, which has been known as tabes S., *phthisis mesariaca, febris mesaraica, febris xanthus infantum* and intestinal scrofula. Intestinal tuberculosis in children results in early and extensive infection of the mesenteric glands, from which reinfection usually terminates life by miliary tuberculosis. Secondary tuberculosis appears to be more frequent in adults than in children. In children intestinal tuberculosis is not within 30 to 40 percent, in the adult in 60 to 70 percent. The local predisposing lesion, although important in determining localization, is not essential, as the tubercle bacilli can penetrate the intact mucous membrane.

In six of Czerny's cases subjected to operative interference the patients were between 25 and 50 years of age, the average age being 39. In four of the cases tuberculosis was hereditary, in two cases the disease followed typhoid fever, and in one it was preceded by an acute attack of parametritis. In three of the cases the intestinal disease was complicated by pulmonary tuberculosis, and in one by diffuse miliary tuberculosis. In one case the infection occurred by the rupture of a tubercular adnexal abscess into the intestine, and in another the intestinal tuberculosis was complicated by actinomycosis.

Clinical experience has shown that intestinal tuberculosis pursues a more benign and chronic course in the adult than in children, and consequently the primary form of intestinal tuberculosis amenable to successful surgical treatment is met with most frequently in young adults and persons of advanced age, seldom in the case of infants and young children.

Infection from the blood is undoubtedly of quite common occurrence in primary and secondary intestinal tuberculosis. The most favorable cases for successful surgical intervention are those in which a localized predisposing

lesion furnishes an infection atrium for the entrance of tubercle bacilli into the tissues. These are the cases in which characteristic solitary or multiple tubercular ulcers develop which manifest an intrinsic tendency to heal, and in which an operation finally becomes a necessity after symptoms of obstruction indicate the existence of a cicatricial stenosis.

Pathology.—Intestinal tuberculosis presents itself clinically and pathologically in the form of a chronic catarrhal or ulcerative enteritis. The inflammation which follows the tubercular infection is characterized by a series of pathologic processes common to all tubercular affections, influenced and modified, however, by the structure and function of the tissues involved. The primary seats of infection are the glandular appendages of the mucous membrane, the lymph-follicles and Peyer's agminated glands. The mode of infection resembles typhoid fever in many respects. The lower portion of the ileum and the ileocecal region are the most frequently infected, although any portion of the intestinal canal may be involved primarily or by extension. Of six cases of intestinal tuberculosis reported by Schiller (*"Ueber die Darm Operationen an der Heidelberger Chirurgischen Klinik aus den letzten vier Jahren."* Dissertation, 1896), which were operated upon by Czerny during a period of four years, the disease involved the ileocecal region four times, and the descending colon twice. In all cases of cecal tuberculosis operated upon by Czerny, the ulceration was limited on one side by the ileocecal valve; the mucous membrane of the cecum was extensively ulcerated, presenting elevations and depressions and polypoid excrescences between the ulcers; the cecal wall was much thickened and indurated. The lumen of the cecum was usually found contracted, the stenosis being the direct cause of the intestinal obstruction. In one case the mechanical impediment was found to be a sharp flexion at the insertion of the ileum into the cecum. In one case the contracted lumen of the cecum was divided by a band of cicatricial

tissue. The bowel below the obstruction was, as is always the case, nearly empty, reduced in size and anemic, while on the proximal side reverse conditions existed, which facilitated circular suturing after excision. In acute cases, such as are observed in children, and which seldom come to the notice of the surgeon, the disease is usually diffuse and often implicates a large section of the intestinal canal above the ileocecal valve. Tuberculosis is apt to attack a portion of the intestinal canal subjected to mechanical irritation, as is the case in hernia.

A number of cases of tuberculosis of hernia have been reported. Bruns (*"Beitrage zur Klin. Chirurgie."* B. ix, p. 206) adds one new case to those previously published. In these thirteen cases the hernial sac was attacked ten times, and in seven it was alone the seat of disease. This, together with other conclusions, substantiate the belief, that "tuberculosis of hernia" may occur as a primary disease; generally, however, it is associated with peritoneal tuberculosis.

It appears from the present literature on the subject that tuberculosis in the ileocecal region and the colon is usually a disease of adults, although there are a few cases on record in which the intestinal canal at and below the ileocecal region was affected in children not more than ten years of age.

Reclus (*Le Bulletin Medicale*, June 25, 1893.) has called attention to the rapidly increasing number of cases of cecal tuberculosis which have been operated upon. The cases of Bouilly, Terrier, Hartmann, Reynier, Broca, Roux, Salzer, Billroth and Hochenegg, the anatomic researches of Duguet, Spillmann, Hérard, Cornil and Hanot, and the more recent descriptions of Pilliet and of Le Bayou have thrown some light upon this hitherto but-little-recognized affection. This affection may manifest itself as a localized tuberculosis without infiltration and as a purely local disease. This suffices to place this intestinal lesion among the surgical tuberculoses. From the moment it is a limited

focus and this focus is accessible, in such favorable circumstances intervention is legitimate. The greatest number of cases of cecal tuberculosis so far reported have been over 25 years of age.

It seems that two distinct anatomopathologic forms may be described, associated with different symptoms; the one a fibrous and the other an ulcerating variety; moreover, these may be combined, or there may be noticed many intermediate stages between the varieties. The majority of cases thus far reported have been characterized by an abundant tissue proliferation, which imparted to the swelling much of the aspects of carcinoma. The inflammatory mass is almost always found freely imbedded in plastic adhesions, and it is difficult if not impossible to outline the anatomic landmarks of the parts involved. Ordinarily the lesions are most marked around the ileocecal valve. The appendix is generally affected and constitutes a portion of the inflammatory mass.

The second or ulcerated form may present thickening of the peritoneum and adhesions around the intestinal loops, but these have not the remarkable hypertrophy of the other form; on the contrary the ulcerative process predominates, the mucosa has often completely disappeared, especially at the site of the ileocecal valve. Ulceration often leads to abscess and fistula formations. The fistulous openings are often multiple.

Cornil believes that in such cases the primary infection takes place in the *appendix vermiformis,* more especially when it is the seat of a fecal concretion or foreign body.

The tubercular infection may take place in the upper portion of the intestinal canal. Claude (*"Ulcerations tuberculeuses du duodenum," Bulletin de la Societe anatomique de Paris,* No. 8, 1896) made a postmortem on a man 33 years of age who had died of pulmonary tuberculosis. He found tubercular ulcers in the upper portion of the duodenum; four other ulcers were found in the ileum. He attributed

the intestinal disease to infection from the blood. During life this patient never showed any symptoms referable to the intestinal canal. The tubercular nature of the intestinal affection was established by histologic and bacteriologic examinations.

The entire length of the intestinal canal is seldom affected by tuberculosis, and in the exceptional instances when this is the case the disease pursues a rapidly fatal course. It has already been stated that intestinal tuberculosis always begins in the lymph-follicles or Peyer's patches. The tubercular process is at first submucous, and reaches the surface only after degeneration and ulceration have taken place. The glands become swollen, can be felt under the epithelial lining as small hard nodules which present a grayish color before caseation sets in. With the onset of caseation the swelling increases in size and assumes a yellowish color. As soon as the overlying epithelial lining is destroyed softening of the inflammatory product and ulceration set in. The primary ulcer is small and round with yellowish margins. At the time the crater-like defect takes place the mass is not larger than a hemp-seed. Such small ulcers may heal, but more frequently progressive extension takes place in the direction of the blood-vessels. In Peyer's patches the appearance of sieve-like defects can be seen during the early stages of the disease, which Rokitansky described as primitive tubercular ulcerations. They constitute the preparing stage or secondary tubercular ulcers. Even in superficial ulcers tubercles can constantly be found between the muscular fibers. By confluence and progressive infection the surface defects increase in size. Not infrequently remnants of intact mucous membrane remain between the different points of ulceration. The shape of the ulcer is variously modified by the confluence of several ulcers. The most extensive ulcers are found in the cecum, colon and terminal portion of the ileum.

The intrinsic tendency of intestinal tubercular ulcers is

to increase in size in the direction of the blood-vessel; that is, transversely to the long axis of the bowel, a pathologic feature which was first pointed out by Rokitansky (*"Lehrbuch der path. Gewebelehre,"* 1871, p. 327). The tubercular infection follows the lymph-sheath of the blood-vessels. Through the lyphatics the infection extends to the serosa, upon the surface of which miliary tubercles are often found over an area corresponding in extent to the base of the ulcer. The mesenteric glands are infected through the same channels. In children the mesenteric glands are often affected without an antecedent intestinal lesion. In such cases the tubercle bacilli penetrate through the mucous membrane and enter the lymphatic system without producing a demonstrable surface lesion, or infection takes place by the way of the general circulation. Infection through the mucous membrane undoubtedly is often determined by catarrhal enteritis, which damages the epithelial lining and prepares the way for invasion from the intestinal canal.

Extension of the ulcer in the muscular coat takes place by progressive extension of the ulcerating process and by diffusion of the infection through the lymph-channels. As soon as the serous coat is reached secondary plastic peritonitis is almost the constant result. Usually the peritonitis is limited to the affected portion of the bowel, between which and the adjacent viscera firm adhesions are formed. In exceptional cases the peritonitis becomes profuse without perforation. More frequently, however, the diffuse tubercular peritonitis is caused by the rupture of a periintestinal tubercular abscess. Perforation of a tubercular ulcer is often prevented by early and firm adhesions. In one of the cases reported by Rindfleisch the intestine was found perforated at five different points without causing diffuse peritonitis owing to the existence of firm adhesions. Perforative peritonitis is so rare in intestinal tuberculosis that Leube saw only two cases during his service in the clinic at Erlangen. Lendet reports six cases that occurred

in his practice which were due to tubercular affection of the appendix. Eisenhardt (*"Ueber die Haufigkeit und Vorkommen der Darmtuberculose," Dissertation,* Munich, 1891) found perforation in 28 out of 566 cases of intestinal tuberculosis examined postmortem. Extension of the disease to other parts and organs frequently takes place through the lymphatic system.

Tubercular lymphadenitis is a frequent and, in long-standing cases, a constant concomitant pathologic condition, as was first pointed out by Schüppel and Rindfleisch. The observations made during operations for intestinal tuberculosis and the results of postmortem examinations combine to show that retrograde metamorphosis of the inflammatory product of the tubercular glands takes place very slowly. The writer has seen repeatedly tubercular mesenteric glands as large as a hazel-nut which had not undergone any decided cheesy degeneration. Coagulation and caseous degeneration, however, occur in the course of time, but liquefaction and abscess formation in and around tubercular mesenteric glands are of rare occurrence. Infiltration and thickening of the intestinal wall occur most frequently and reach the maximum height in cases in which the tuberculosis is located in the ileocecal region or colon. In these localities the disease is most frequently primary, a fact which would explain its chronicity and comparatively benign nature. When the tubercular process affects this part of the intestinal canal the resultant swelling is often of larger size and has frequently been mistaken for malignant disease. In such instances the intestinal wall has been found several centimeters in thickness.

In acute cases of intestinal tuberculosis the ulcers manifest little or no tendency to repair. In chronic cases attempts at healing or complete healing is the rule. Eisenhardt (*op. cit.*) in examining the postmortem records of 566 cases of intestinal tuberculosis, found that healing was com-

pleted in only 10, while in 25 instances the ulcers were only partly healed.

Attempts at cicatrization are frequently seen, but very often while healing is going on in one part of the ulcer progressive infection and destruction are witnessed in another portion. The healing of a tubercular ulcer of large size requires an enormous quantity of new material, which is composed largely of new connective tissue. The scar-tissue always evinces a tendency to contraction, which leads to stenosis and flexion. If the ulcer is circular, healing is attended by contraction of the lumen of the bowel, which finally leads to intestinal obstruction. If only one side of the circumference of the bowel is ulcerated, healing will result in contraction and flexion. The healing of several tubercular ulcers gives rise to the development of multiple strictures, which have been found by several surgeons in operations for intestinal obstructions. Progressive cicatricial contraction may eventually result in almost complete obliteration of the lumen of the bowel. In one of Scheuer's cases the stricture at the time the intestinal resection was performed for obstruction was so narrow that it admitted only a probe three millimeters in size. The healing of intestinal tubercular ulcers is seldom followed by complete recovery, as all such patients are liable later to intestinal obstructions and reinfection from the tubercular mesenteric and retroperitoneal glands.

Symptoms.—Intestinal tuberculosis may run its entire course from beginning to end without any symptoms which would point to the intestinal canal as the principal seat of the disease. Tubercular ulcers of the intestines are often found at necropsies without the slightest evidence of their existence during life. That an isolated tubercular ulcer of the intestine may exist without causing symptoms before perforation occurs, is shown by a case reported by Baumgarten (*"Ueber latente Tuberculose,"* Volkmann's *Klinische Vortrage,* No. 218). A young soldier, in almost perfect health, died sud-

denly of perforative peritonitis. The postmortem revealed, as the cause of the peritonitis, a solitary perforated ulcer, the size of a penny, in the lower portion of the ileum. Microscopic examination of the tissues demonstrated the tubercular nature of the ulcer. No evidence of tuberculosis was found in any other organ of the body.

In other cases the symptoms are misleading. Thus Leonhardi-Aster (*"Ueber einen unter dem Biide pernicioser Anamie verlaufenden Fall von Darmtuberculose," Deutsche Zeitsch. f. prakt. Med.*, 1878, Nos. 8 and 9) recorded a case of intestinal tuberculosis which presented all the clinical features of pernicious anemia, the intestinal symptoms being masked by the progressive anemia for which no cause could be assigned until the necropsy revealed the characteristic pathologic lesions of intestinal tuberculosis. In cases of diffuse acute intestinal tuberculosis the most important and prominent symptoms point to the existence of an intestinal catarrh. Profuse diarrhea is seldom absent, the stools being copious and liquid. Colicky pains referred to the umbilicus, slight tenderness on deep pressure, progressive emaciation and more or less rise in temperature, especially toward evening and during the night are symptoms well calculated to arouse suspicion in regard to the probable tubercular nature of the intestinal disease. Enlarged mesenteric glands can often be palpated through the thin, relaxed abdominal wall. In some cases enlarged mesenteric and retroperitoneal glands can be detected by vaginal or rectal examination. The severity of the diarrhea is attributable more to the existence of the complicating intestinal catarrh and increased peristalsis than to the ulcers themselves. Pulmonary tuberculosis, as well as tuberculosis of any other important organ, often overshadows and masks the intestinal complication. In all cases of pulmonary tuberculosis attended by diarrhea, which does not yield to the ordinary treatment, we have reason to assume the existence of intestinal tuberculosis. In primary intestinal tuber-

culosis the early symptoms set in insidiously, the disease is usually mistaken for an ordinary intestinal catarrh and is regarded as such until the negative results obtained from the treatment induce the physician to make a more thorough investigation of the case. The suspicions of the tubercular nature of the intestinal disease are materially strengthened if it can be ascertained that the patient has made unsterilized milk a staple article of diet.

The frequent presence of traces of blood in the stools is decidedly suspicious. If the ulcers are located in the small intestine the blood is intimately mixed with the stools; if in the large intestine the extravasated blood often forms a coating for the otherwise well-formed fecal masses. Pus in the stools is found, as a rule, only when the tubercular process involves the lower portion of the large intestine. In the small intestine the pus that forms on the surface of the ulcers is speedily washed away with the intestinal discharges and, on the other hand, pus formation is checked by the peptic action of the intestinal juice, which acts as an efficient antiseptic. Bamberger has called attention to the character of the stools in intestinal tuberculosis, which according to this authority frequently contain transparent particles of mucus resembling frog-spawn or boiled sago grains. These masses of mucus are probably formed in and are discharged from the lymph-follicles of the intestinal mucous membrane, the structures primarily affected by the tubercular process.

Virchow places less diagnostic importance on the presence of this pathologic product, which he believes has often been mistaken for partially digested starch.

The partial or complete healing of a tubercular ulcer of considerable size is usually announced clinically by the appearance of a complexus of symptoms which indicates the existence of chronic intestinal obstruction, caused by the cicatricial stenosis which so constantly attends and follows the healing of a tubercular ulcer. Intermittent colicky

pains in the umbilical region, diarrhea alternated with constipation, and perhaps occasioned attacks of vomiting, are the most prominent clinical manifestations in such cases. Chronic intestinal obstruction from this, as well as other causes, often terminates in an acute attack. In rare cases, the chronic obstruction presents few or no symptoms until symptoms of acute obstruction set in, when operation or necropsy reveal the presence of an old cicatricial stenosis, which was never suspected before the abdomen was opened.

The formation of a chronic abscess in the ileocecal region, or any part of the abdominal wall, in connection with intestinal symptoms of long standing, always suggests the probable existence of a tubercular intestinal ulcer. The writer has always observed these in the ileocecal region, over the ascending colon, and in one case in the umbilical region. These are the cases in which, prior to the perforation of the ulcer, adhesion takes place, excluding the peritoneal cavity, followed by the formation of a mural tubercular abscess. In more than one case the tubercular nature of the abscess and its intestinal origin were predicted before the abscess was opened. A fecal fistula is sure to follow the opening of such an abscess. The granulations lining the abscess cavity may for a time prevent the escape of intestinal contents, but in the course of a few days or weeks the granulations give way and the fecal fistula appears. If the disease is attended by plastic peritonitis to any considerable extent the inflammatory exudate may often be distinctly outlined by palpation.

Voehts calls attention to a condition of diagnostic value, often met with in such cases, in the form of indurated plates in the peritoneum of almost cartilaginous hardness.

Such areas of induration are not only found in the ileocecal region, along the course of the colon according to the seat of the disease, but also in Douglas' fossa. In the pelvis these indurations may grow to actual exudates of consider-

able size, which in women might be mistaken for diseased adherent ovaries or tubercular Fallopian tubes.

In four out of six cases operated upon by Czerny a diagnosis of probable intestinal tuberculosis was made before the operation was performed. The diagnosis was based largely upon the clinical history which indicated the existence of a cicatricial stenosis in the ileocecal region and the presence of a swelling, which on percussion yielded a dull tympanitic resonance, and which was movable and only slightly tender on pressure, and the periodic abdominal pains caused by exaggerated intestinal peristalsis, as described by Czerny, König and Benoit.

The anatomic location of the stricture is indicated by clinical phenomena which deserve a careful study and analysis. Stenosis of the duodenum above the entrance of the bile-duct, gives rise to the same symptoms as stenosis of the pylorus, but below this point it is attended by symptoms which not only simulate the latter affection, but also obstruct the entrance of bile into the intestinal canal.

The most important condition which charterizes duodenal stenosis below the bile-duct, is the constant presence of bile in the chyme and repeated ejections of the fluid by vomiting. On the other hand, of three clinical observations Boas (*"Ueber die Stenose des Duodenum," Deutsche med. Wochenschrift,* 1891, No. 28), shows that fluid taken from the stomach contains not only bile but also pancreatic juice. The contents of the stomach possessed all of the chemic properties of duodenal chyme.

Duodenal differs from pyloric obstruction also by the absence of a corresponding dilatation of the stomach, by the absence of the products of fermentation of the stomach contents and by the absence of sarcinæ and yeast-cells. No distinction can be made between obstruction in the lower portion of the duodenum and the upper part of the jejunum. Vomiting of large quantities of bile indicate duodenal obstruction, while the ejected material assumes more and

more the character of feces, the lower the location of the obstruction. In eight out of twelve cases of duodenal obstruction, collected by Gerhardi and Hagenbach, the disease was due to carcinoma, cysts or hemorrhage of the pancreas. The search for the pancreatic juice in the stomach contents is important. A number of well-authenticated cases of tuberculosis of the duodenum have been placed on record, and there is no reason to doubt that in isolated cases the ulceration might heal with the usual remote conditions following cicatricial stenosis and intestinal obstruction. If the cicatricial stenosis involves the ileocecal region, or any part of the colon, the usual symptoms indicative of intestinal obstruction in these portions of the intestinal tract, will develop. Diarrhea is the most constant symptom in such cases. In far-advanced cases extensive tympanites, fecal vomiting and complete interruption of the fecal circulation at the point of obstruction complete the clinical picture of intestinal obstruction.

Diagnosis.—The diagnosis of secondary tuberculosis of the intestines presents few difficulties if the primary disease is well marked, and affects an organ readily accessible to examination. Pulmonary phthisis generally precedes and attends secondary intestinal tuberculosis. In women, tuberculosis of the internal genital organs occasionally constitutes the primary affection, and extension takes place to the intestinal canal, either through the lymphatic channels or, as in one of Czerny's cases, by rupture of a tubercular abscess into the intestinal canal. In cases of primary intestinal tuberculosis, an early correct diagnosis is seldom made. There are other ulcerative affections of the intestines which in many respects resemble intestinal tuberculosis. Councilman (*"Johns Hopkins Hospital Reports,"* March, 1892) reports a case of extensive and deep ulceration of the lower portion of the ileum complicated by stricture of the rectum, which terminated in death from perforation and gangrenous periproctitis, and in which typhoid fever and tuberculosis

could be safely excluded as causes. At the postmortem, ulceration of the ileum was found, with invasion of the tissues by colon bacilli. Some of the ulcers presented the appearance of an acute process; others were of a chronic nature. Numerous bacteria, both short rods and micrococci, were found in the superficial necrosed tissue, in some places extending into the cellular infiltration in the submucosa. These microbes did not seem to stand in any direct etiologic connection with the pathologic changes. The writer recently had under his observation for several months a case of chronic diarrhea, which had resisted all remedial measures. The patient was a man about 30 years of age, very anemic and greatly emaciated. No hereditary tendency to tuberculosis and no cause could be ascertained which might have produced the chronic intestinal catarrh. Examination of the lungs and other important organs failed to locate a tubercular focus. The mesenteric glands could not be felt on palpation and rectal examination. The stools were frequent and liquid. The pain slight and referred to the umbilical and hypogastric regions.

Intestinal tuberculosis was suspected. Carbonate of guaiacol and salicylate of bismuth were administered internally and the colon was washed out daily with a copious enema of warm salt-solution. On many different occasions the stools were examined for tubercle bacilli, but none could be found. Myriads of colon bacilli and micrococci were invariably found. The absence of tubercle bacilli in the stools and the marked improvement which followed the treatment, leave but little doubt that this was a case of intestinal ulceration, caused by infection with the colon bacillus.

Bacteriologic examination of the feces in suspected cases of intestinal tuberculosis should never be neglected, as it often furnishes positive proof of the tubercular nature of the disease. Tubercle bacilli, when present in the feces, in which they may be demonstrated by the same methods

as in sputum, are indicative of intestinal tuberculosis, providing that they are observed upon repeated examination, and that clinical symptoms are present which point to the intestines as the seat of disease, as otherwise they may be referable to swallowed sputa.

The best way to find the bacillus is to dilute the feces with distilled water, and to prepare and strain the deposit after centrifugation. Sawyer (*Medical News*, May 23, 1896,) urges the importance, in cases of suspected intestinal tuberculosis, of examining the mucus collected from the rectum, just above the *sphincter ani*, for bacilli. When found, particularly on the surface of fissured stools, these clusters of bacilli are of diagnostic value, and may be relied on to indicate tubercular processes in the intestinal tract. He has thus found them in several cases when they could not be found in the sputum, or when sputum could not be obtained.

If the tubercular enteritis has progressed to the formation of cicatricial strictures, the differential diagnosis between intestinal obstruction from this cause and other inflammatory affections which result in ulceration and cicatricial stenosis, is always difficult and sometimes impossible. In such cases a probable diagnosis must rest on a careful study of the clinical history and search for tubercular foci in other organs.

Congenital stricture.—Congenital stenosis of the intestinal canal may appear as a single or multiple congenital defect, may affect any portion of the intestinal canal and may cause no symptoms until long after birth. Intestinal stricture occurring in infants, children and young adults, without any history of the existence of an antecedent ulcerative lesion, is quite frequently of a congenital origin.

Traumatic stricture.—If in cases of intestinal obstruction from a stricture the clinical history shows that the patient has been for some time in the past the subject of an injury to the abdomen, it should be borne in mind that the stricture may be the direct result of the trauma. Such

strictures are occasionally caused by a blow on the abdomen. Mygiud reports such a case. Intestinal resection was performed six months after the accident for symptoms of obstruction, and the patient recovered.

Traumatic strictures may result from laceration of the mucosa or from plastic peritonitis. In the former variety the lesion of the mucous membrane would be likely to simulate more closely tubercular enteritis than the peritonitis form. In both instances, however, the catarrhal enteritis complicating the chronic obstruction would present some clinical features in common with tubercular enteritis.

Stricture following strangulated hernia.—It has been known for a number of years that intestinal stricture occasionally develops after the reduction of a hernia by taxis or operation. The stricture in such cases is caused by a circular necrosis of the mucous membrane, resulting from the pressure by the strangulation. The elimination of the necrosed tissue is followed by ulceration, and the healing of the circular ulcer finally leads to cicatricial contraction and intestinal stenosis. Garré first described intestinal stricture as one of the remote results of a strangulated hernia. (*"Ueber eine eigenartige Form von Darmstenose nach Brucheinklemmung." Beitrage zur klin. Chirurgie,* B. ix.) He made the observation that in some cases of strangulated hernia the mucous membrane of the bowel at the point of constriction becomes necrotic and is cast off as a slough. The circular defect heals by granulation, and the resulting scar leads to circular constriction.

In his first case the symptoms of obstruction necessitated a laparotomy, which was performed nine weeks after the herniotomy. The patient was 27 years old, and the subject of a preperitoneal inguinal hernia. Intestinal resection to the extent of forty-one centimeters was made, and the continuity of the bowel restored by circular enterorrhaphy. The patient recovered. Examination of the specimen removed showed that the ulcerated surface had not

entirely healed. At one point the ulceration extended as far as the peritoneum.

Ravult (*"Retrecissement cicatriciel de l'intestin au niveau des 2 points de l'etranglement d'une ancienne hernie," Bull. de la Soc. anat. de Paris,* 5, Série iv,) reports a case of double cicatricial stricture of the small intestine which caused death from acute intestinal obstruction. Several years before the last illness the patient was operated upon successfully for strangulated hernia. The acute attack of intestinal obstruction resulted fatally in a few days. The necropsy revealed two strictures eight centimeters apart; the segment of bowel between them was distended by gas. Above the stricture on the proximal side the bowel was greatly distended and vascular, while the intestine below the second stricture was contracted, empty and pale. The strictures were undoubtedly the result of sloughing, ulceration and scar formation, consecutive pathologic conditions caused by harmful circular constriction by the neck of the hernial sac.

The time of the appearance of symptoms of obstruction in this form of intestinal stenosis varies from a few days to a year or more. Pitt records a case of femoral hernia in which symptoms of obstruction appeared five days after the reduction of the strangulated hernia, while in Garré's case the symptoms of obstruction did not set in until nine weeks after the relief of the strangulation by taxis.

The possibility of the existence of a cicatracial stricture due to such a cause must be remembered in cases of intestinal obstruction in which the clinical history refers to strangulated hernia relieved either by taxis or operation.

Stricture following healing of typhoid ulcer.—The healing of typhoid ulcers is very rarely followed by cicatricial stenosis. Treves made a very careful search for stricture of the intestine caused by typhoid ulcer and was able to find only one well-authenticated case. Typhoid ulcers, as a rule, heal rapidly and much of the tissue destroyed is reproduced

by the reparative process, leaving only a minimum quantity of connective tissue, while the healing of a tubercular ulcer is attended by the formation of an abundance of connective tissue, which subsequently undergoes progressive cicatricial contraction. The locations for the stricture are the same in typhoid and tubercular ulcers.

Syphilitic stricture.—Among the multiform visceral lesions caused by tertiary syphilis are to be noted intestinal strictures. According to Rieder (*"Annual of Universal Medical Sciences,"* Vol. I, D. 31,) the lesions causing the obstruction are most frequently met with in the upper part of the small intestine. Syphilitic stricture is not caused by ulceration but by the production of new connective tissue in the submucosa and later in the other coats. The symptoms attending syphilitic intestinal stricture indicate the existence of a mechanical obstruction without the existence of a previous ulceration, as is the case in tubercular stricture.

Ovarian tumor.—The differential diagnosis between a tubercular stricture and intestinal obstruction caused by certain anatomicopathologic forms of ovarian tumor is attended by many difficulties. In one of Czerny's cases of ileocecal tuberculosis, the swelling was mistaken for an ovarian tumor by the attending physician. Veit has shown that in women the differential diagnosis between tuberculosis of the ileocecal portion of the intestinal tract and ovarian tumor which has extended to the mesocecum and mesocolon is always extremely difficult and often impossible.

Malignant stricture.—The two causes which give rise to intestinal obstructions most likely to be mistaken for each other, are cicatricial stenosis following tubercular ulcer and malignant stricture. The ileocecal region is the favorite locality for both of these affections. In intestinal obstruction due to either of these causes the clinical history is characterized by a complexus of symptoms pointing to chronic obstruction, and in either case involvement of the mesen-

teric and retroperitoneal lymphatic glands is sure to occur sooner or later. Tubercular strictures are found most frequently in persons below middle age, while carcinoma is more likely to occur in persons of advanced age. The reverse may, however, be the case, as intestinal tuberculosis may attack the aged and intestinal carcinoma may occur in young adults. The detection of a tubercular focus in another organ, and the discovery of tubercle bacilli in the stools will furnish evidences of the tubercular nature of the obstructive lesion and will exclude the probability of the existence of malignant disease.

THE TREATMENT OF TYPHOID FEVER—THE USE OF OPIUM IN DIABETES—THE CURE OF ANEURISM BY ELECTROLYSIS—THE TREATMENT OF TUBERCULOSIS—THE USE OF DIFFUSIBLE STIMULANTS AND OF DIURETICS—THE ABUSES CONNECTED WITH ANESTHETICS

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When I accepted the courteous invitation of your Secretary to deliver the Address in Medicine before the Ohio Medical Society it occurred to me that I could not do better than to consider a number of topics of a medical character rather than one general theme. We are met together to discuss those matters which will prove of benefit to us in the practice of our profession, and our object is to go to our homes with clear and distinct ideas as to the methods we should employ in the diagnosis and treatment of disease.

The first subject of which I desire to speak is the proper treatment of typhoid fever, a subject which seems so hackneyed as to be worthy of instant dismissal, yet who of us with experience can claim that the ideal treatment of

this malady is as yet discovered? Yet this ideal should not be far to seek, for the mortality of the disease must remain at a certain point as long as the disease occurs. That is to say, a certain proportion of cases in which great susceptibility to the disease exists or who receive a very virulent dose of the infection and who come under our care late in the malady must die as long as we are all mortal. The death rate from typhoid fever is today less than it has ever been, and this decrease is present all over the world, chiefly as a result of prophylaxis, for by this means the number of cases has been decreased in a manner almost equal to the decrease in small-pox since the use of vaccination. Thus in Munich the mortality from typhoid fever has decreased from 453 in 100,000 in 1858 to 3.4 in 100,000 in 1896 as a result of improved drainage, and in every city in the world this improvement, made *pari passu* with an improved water-supply, has produced results of almost equal degree. These facts I have still further emphasized in a paper read before the College of Physicians of Philadelphia in March last. The decreased death rate also indicates a decreased severity of illness in those who recover, and thus we find that today typhoid fever is, with a few exceptions, distinctly on the wane as to severity and mortality. This decreased malignancy is not, however, the only cause of the decrease in death rate which has fallen from 30 or 25 percent to about 15 percent or less in this country. It is due to the fact that the medical profession has learned one dominant fact, namely: that while we can modify the severity of typhoid fever by prophylaxis and by proper treatment, we cannot abort it or cure it. To express it briefly, the physician must guide his patient through the storm of his infection as a captain guides his ship. He can relieve dangerous symptoms, protect to some extent certain parts from fatal damage, place the whole system of his patient in a state best qualified to resist the disease, but he cannot shorten the storm by any direct means. This fact rests upon two others, namely: that

the infectious process runs a given course in each case so far as its length is concerned, and, secondly, the physician, unlike the captain of a ship, takes charge of his patient not before the storm but after it has, in gradually increasing intensity, been developing in his patient for two weeks before it has manifested itself, and often for as long a period again before its character is recognized. The pathologic changes have been produced, and, even if they do not progress further, the process set up must run its course, in the case of the intestine, for example, till the glandular changes are completed in ulceration or recovery. Every plan of treatment which has been tried, in a sufficiently large number of cases to be studied statistically, emphasizes these facts and is directed to a modification of the symptoms and a protection of the patient against injury, and not to a true cure in the sense of specific medication.

In Germany some 40 years ago typhoid fever patients were treated by catharsis, emesis and venesection. Today the vast majority are treated by the cold bath, which, whatever objections may be raised to it, at least permits the system to combat disease and eliminate toxins without fighting the treatment in addition. Again, good nursing and the recognition that the conservation of energy is absolutely essential for the saving of life, aids non-meddlesome methods.

There is another plan of treatment largely employed in the treatment of this disease, namely: that by antiseptics. In my belief both the bath method and the antiseptic plans are but gropings in the dark, each possessing a glimmer of the light of truth in them which prevents us from being lost. It is a safe rule of practice to take a middle stand in accepting and carrying out any particularly highly-lauded plan of treatment of a disease. Particularly should the physician avoid routine plans of treatment, for as long as human beings differ in their characteristics, and microorganisms differ in their virulence, each and every patient must be treated

by himself, or, in other words, the treatment must be varied by the necessities of the individual. For this reason the plunging of every patient in a tub of water at 70° F. because he has typhoid fever is not good therapeutics, and so the use of purgatives or intestinal antiseptics, in practically unvarying amounts, is unwise. All great underlying principles may be right in theory, but they must be so utilized as to meet with exigencies of life. In other words, the cold-bath treatment and the antiseptic treatment do good in principle, but they must each be suited to the patient before us.

There is not time in this discourse to show how a large part of the low mortality claimed by the enthusiastic followers of either of these plans is in part due to the careful nursing, feeding and stimulation of their patients. I have recently (*Therapeutic Gazette* for March, 1898,) proved that the bath only decreases the mortality about 3 percent in itself. The chief fault with the adherents of both plans is that they are so well satisfied each with his method that they will not use the other, and nothing is so disastrous to patient and doctor as the confidence of the latter that the plan he is using is the best to be found. It may be as good as he knows of, but his business is to find a better one, or at least to seek for it. In regard to the antiseptic treatment so-called, it has not found general recognition because the grain of truth that intestinal fermentation and germ development is harmful has been surrounded with such a mass of theory, not in accord with facts, and its technic has been so varied and so futile or heroic that the grain of fact is overwhelmed. Intestinal antisepsis in typhoid fever is a good thing, but it is not the only good thing and often not a necessity. So, too, the bath is not the only thing needed or always a necessity. Beyond the use of antifermentative drugs to combat evidences of intestinal disorder, I confess that I have never resorted to this sole plan of treatment for the reasons given, and so, too, with the cold bath, I have

been impressed with the fact that the full cold bath is not for everyone. As I have said before, everyone does not need croton oil for constipation or 20 drops of digitalis for a failing heart. The skill of the physician consists in knowing not only the general remedy but its dose.

It seems to me therefore that in the use of antiseptics and purgatives we should use judgment and not routine, and that the same holds true of baths. It is our duty to understand the great underlying principles of a plan before we try it or modify it. In the case of the bath we find that its antipyretic powers are now recognized as being its least useful characteristics, that the most able hydrotherapeutists not only admit but assert that he who expects to throttle the fever by the use of the bath will be mistaken, and that the benefits to be derived lie in the improvement of the circulation, the overcoming of stasis, the production of leucocytosis, the encouragement of oxidation and the reactive awakening of dormant and intoxicated venous centers. If these are the desiderata, how are they to be attained? Without doubt in a fairly large proportion of cases in which the temperature is high, and in itself dangerous because of its height, by the use of the plunge, the effects of which are most desirable; but there are conditions of mind and body which are capable of contraindicating the bath just as there may be conditions contraindicating quinin in malaria. Are we, then, to ignore the contraindication or are we to allow the patient to suffer for want of these beneficent effects? We are to do neither, but to devise another plan for producing them without the factors contraindicated. This can be done by a modification of the cold bath in such a way as to preserve some of the good and expurge its evil effects, and finds its type in the properly applied cold sponging. I believe this should be used as follows, to produce the effects needed, and just as the bath will prove futile if badly given, so will the sponging. The patient should be placed on a blanket on his own bed, stripped, and the nurse should

then apply rapidly over his surface a sponge dipped in water varying in temperature with his reactive power and persistency of temperature. It is my custom in the presence of moderate fever, say of 102.5°, to order sponging with water at 70°. If the temperature does not fall readily under this, to use water at 60°, 50° or with ice in it. At the same time that the cold is applied the patient is thoroughly and actively rubbed until reaction takes place and the surface of his body is bright red. By this treatment the vascular tone can be as well, if not better, maintained than if the patient is put in a tub, and no cyanosis and severe shivering occurs. Further, it is possible to properly rub and sponge the great muscles of the back, in which region stasis and bed-sores often form because these parts are not rubbed when the patient is in the tub. The rubbing or massage is a very important part of the bath, and if it is not performed both the tub-bath and sponge-bath are nearly futile. In those cases when the fever is not marked, sponging with alcohol and rubbing may be used to maintain capillary circulation and improve the nutrition of the connective tissues. We are told by the full bath advocates in this country to tub all cases unless they have hemorrhages or perforation or are far advanced in the disease. It seems very much more rational to suit the needs of each case by modifying the bath provided we are sure to obtain reaction, overcome stasis and improve nervous tone.

Finally, in regard to typhoid fever, let me urge upon your attention the wisdom of giving a more generous diet during the course of this exhausting malady. Surely a pure milk diet is needlessly severe and loads the stomach with large quantities of liquid. Eggs up to three or four a day, soft custards, arrow-root and thin corn-starch may often be given with advantage, and even meat broths may be used, although they sometimes cause diarrhea and may act as culture media for the bacillus. If Grave's epitaph was to be "he fed fevers" surely typhoid fever is one of them.

THE USE OF OPIUM IN DIABETES MELLITUS

Another subject to which we may turn with interest is the treatment of diabetes mellitus. This disease is apparently very greatly on the increase, as I pointed out in a brief paper published about a year ago. The statistics then published showed that the increase seems to be well distributed all over the world, although it is greater in Europe than in the United States. On the one hand the claim has been made that this increase is not real, but due to the fact that more careful and competent urinary examinations are made today than formerly. On the other hand, it is now recognized that glycosuria or sugar in the urine is not diabetes, although it may be, when joined with other symptoms, one of the necessary facts to complete the "symptom complex" of the malady. Again, the increasing frequency of the disease is shown by the mortality lists due to this cause and not by the reports as to the frequency of this ailment in living persons. The important things for us to remember, after recalling the fact that glycosuria in itself is not diabetes mellitus, is that in some cases it is a mere overflow of carbohydrate material, and the fact that the malady is a symptom, not a disease in itself. It may arise from a number of causes and each of these seems widely separated in physiology. This being the case, it is not hard to discover why one case will be greatly benefited and another not aided by any particular plan of treatment.

There is not time for me to discuss with you the latest and most probable theories and results in studying diabetes. I wish, however, to call your attention once more to the fact that in that class of patients in which diabetes mellitus is most commonly met with, namely Israelites, the use of full amounts of opium in conjunction with careful regulation of the diet seems very efficacious in a fairly large proportion of cases. The notes of one case in particular will be of interest in this connection, the more so as they illustrate how patients suffering from true diabetes mellitus can

not only obtain good results from the use of large doses of opium, but also utilize the drug in the system to such an extent as to have almost none of the evidences of its action.

A Hebrew, aged 47, came under my care last January. His history has no bearing on his case except that he had had a great deal of trouble recently. Eight months before I saw him he had noticed great thirst and begun to suffer from polyuria. He speedily lost 30 pounds and was now emaciated to the last degree. The specific gravity of his urine was 1.040, and contained from 8 to 10 grains of sugar to the ounce, while the quantity passed varied from 70 to 80 ounces a day. After putting him on a strict antidiabetic diet for two weeks, the urine fell to about 40 ounces and the sugar to about three grains to the ounce; and, after this had been accomplished, the opium was begun in ascending doses. The beginning dose was a quarter of a grain three times a day. This was increased a quarter each day until he was taking 3½ grains and the sugar was at about two grains to the ounce. When taking six grains a day his patellar reflexes began to return, and when he reached seven grains three times a day no sugar could be found after repeated examinations. From the beginning to the end of the treatment this patient never gave the slightest evidence of the ordinary effects of this drug. Even his pupils did not show marked contraction.

TREATMENT OF ANEURISM

The devolpment of aneurismal growths involving the larger vessels has been for many years a source of much distress to medical men, not only because the condition is in itself very grave, but also because it has been one which we have been practically unable to control. The gradual increase in the disease process, the constant distress of the patient in body and mind, and finally the inevitable death from rupture, all render such cases worthy of our pity and of every effort capable of producing cure. It is true that

such cases are not rapidly fatal in all instances, but the writer has seen only one instance of aortic aneurism which reached large dimensions in which the patient's life has been prolonged for years by natural processes and with the power of following her ordinary occupation.

Because of the inevitable fatal ending of these cases surgeons have resorted to many different and heroic measures for their relief, such as the injection of irritants into nearby tissues, the introduction of horsehair or other foreign bodies into the sac and the passing in of a long platinum needle, through which was passed an electrolytic current. All of these measures have failed to produce desirable results, and some have done actual harm. There seems to be only one moderately safe and rational method of dealing with aortic aneurism, namely: the method originally devised by Coradi and which has been employed in fourteen cases up to the present time, my own patient being the fourteenth. When we consider the great fatality of aneurism of the aorta, the many accidents which may occur to such patients, and the impossibility of knowing beforehand the exact size and shape of the aneurismal sac, the fact that no one of these fourteen cases has died during the operation is remarkable, and the prolongation of life in a number of them may be said to have thrown much credit upon this procedure. This consists in passing into the sac through a hollow needle a number of feet of wire, which has previously been perfectly drawn so that kinks do not readily form in it. The wire is first wound around a small glass spool, so that when it is removed from the spool it will speedily coil up again. After a number of feet have been introduced according to the size of the sac, the wire is attached by its external end to the positive pole of a galvanic battery, while a large wet-clay electrode is placed on the abdomen or on the small of the back. By means of a rheostat the current is now quietly turned on to the amount of about 20 milliamperes, at which strength it passes for about 10 minutes. After this

the current is gradually increased until about 70 milliamperes are passing, and this may be continued for about one hour. The duration depends, however, upon the signs presented by the aneurism and the patient. If it is evident that the process of coagulation of blood about the wire is well advanced early in the operation, the current is not continued as long as if clotting forms slowly. As a rule, within an hour, or even half an hour, the needle is found to be partly fixed, or at least not to be so freely movable by the fingers of the operator, or the blood-stream itself, and this, of course, indicates that the clot is holding it in place. The following is the history of my patient, which, as it covers many of the important points connected with the operation, is worth reading:

H., man, aged 46, entered my ward in the Jefferson Medical College Hospital in January, 1898. He has an old specific history, a history of muscular strain and of a bad burn. On admission he suffered from pain, dyspnea and cardiac disturbance. The pain was typically cardiac and radiated down his left shoulder and arm. On examining his chest there was found a well-marked bruit over the entire pericardium but the points of greatest intensity of thrill and bruit were found in the second left intercostal space. At this point auscultation revealed a loud bruit unmistakably aneurismal, and palpation the characteristic expansile pulsation. A diagnosis of aneurism of the latter portion of the transverse and beginning of the descending aorta was made. He now developed a brassy cough and was slightly hoarse. Later his sputum was tinged with bright blood, and the pain in the eroded ribs became excessive. As the patient had not improved under the use of ascending doses of the iodid of potassium combined with aconite to lower arterial tension and quiet the action of the heart, and, as the persistently bloody sputum seemed to indicate that the growth was perhaps about to rupture into a bronchus, I advised him to submit to the introduction of wire and electrolysis, although

he was informed of its danger and possible failure of doing good.

To this proposition he consented, and on Thursday, March 3, before my class, I performed the operation with the kind assistance of Dr. D. D. Stewart, who has now done the operation a number of times. The skin over the aneurismal sac was first prepared for the operation by being sterilized. A few drops of a solution of cocain were next inserted under the skin over the sac to produce dermal anesthesia, and then a gold needle well insulated and hollowed out like a large antitoxin needle was passed directly into the sac. As soon as it entered the sac blood spurted from it freely, showing that the puncture had been a true one. Fine gold wire was now passed slowly into the sac through the canula until nine feet had been introduced, when the external end of the wire was attached to the anodal pole of a battery and the current turned on, at first 20, then 40, and finally 70 milliamperes. Very shortly after the stronger current was applied the needle was seen to be moving less freely and on testing it with my fingers I found that it gave the sensation of being partly fixed at its internal tip. At the end of an hour and twenty minutes the current was stopped and the needle carefully withdrawn, no flow of blood taking place. The wire was snipped off close to the skin and pushed under it. For several hours after the patient was slightly shocked, largely because of his nervousness before and during the operation. After this he speedily rallied, and the next day almost all the bruit had disappeared, until in 48 hours it had all gone. The expansile pulsation was also greatly decreased and the thrill much lessened. Care must be taken that the needle is perfectly insulated, as otherwise the skin about the entrance of the needle will slough badly.

It is now nine weeks since the operation. The man walks about the wards, has no dyspnea, no bloody sputum and no expansile pulsation.

Finally, let me call your attention to the following case, operated upon by Stewart in 1893, which lived till the early part of 1897, and then died of pneumonia. He was repeatedly under my care in my ward in the winter of 1895 and 1896, and while there I had the pictures taken which I utilized in my book on Diagnosis and in an editorial on a case of this character reported by Hershey of Colorado in the *Therapeutic Gazette* for September, 1896. The large size and great erosion of this sac made death seem imminent and inevitable when the operation was done, which certainly greatly prolonged his life, made him comfortable and relieved him from suffering entirely.

It is manifest that a large proportion of these cases cannot be benefited by any measure, but if we can save even a small percentage of patients suffering from an otherwise fatal malady, it is certainly worth trying, particularly as they may return to work and usefulness, as, for example, in Noble's case of abdominal aneurism operated upon by this method after celiotomy had been performed.

CAMPHORIC ACID IN PULMONARY TUBERCULOSIS

At the risk of being accused of harping upon one topic too continuously, I wish to call your attention to two methods of treatment which are in my experience distinctly palliative if not curative in pulmonary tuberculosis. The first of these is the use of camphoric acid in the treatment of night-sweats. It has proved so constantly serviceable in my hospital wards and practice for a number of years that I am anxious to see its use more general. If given long enough before the sweat to permit of its absorption so that its effects may be well exerted, it gives results far better than any other antisudorific with which I am acquainted if given in cachet in the dose of 10 to 20 grains. Even larger doses may readily be used. A very important fact is that it seems devoid of any disagreeable action and does not arrest the other secretions of the body as does atropin.

OIL OF CLOVES TO RELIEVE THE COUGH OF ADVANCED TUBERCULOSIS

The second remedy to which I wish to call your attention is the oil of cloves given, by the mouth and hypodermically, for the purpose of decreasing cough and expectoration in advanced pulmonary tuberculosis. Of this treatment I have spoken before, and my further experience confirms my favorable opinion of it. The use of the oil hypodermically in the dose of five drops mixed with 30 to 60 minims of the best French olive oil, sterilized, is productive of considerable local pain for a number of minutes, but the anesthetic properties of the oil soon overcome this and patients tell me that the relief from cough more than repays them for the pain. The injection is given once a day into the loose tissues of the back. For its simultaneous internal use it is best given an hour after meals in five, ten or fifteen-drop doses. These doses must be used with caution, as the oil may disorder the stomach. Not only is the cough and expectoration decreased, but the sweats and hectic fever are generally modified to a very great extent.

CAMPHOR, A DIFFUSIBLE STIMULANT

In this brief review of some of the less common remedies, let me say a few words in regard to the value of camphor as a general diffusible stimulant in exhausting diseases and for the same purposes in medicine as we commonly employ strychnin at this time. Graves, of Dublin, regarded it as one of the best remedies we possess for the prevention or relief of collapse, and yet the profession has in its search for new things given it far less attention than it deserves. It has been found of great value both when given internally and hypodermically in such severe maladies as Asiatic cholera and many other ailments. A large amount of literature might be gathered concerning its value, but I need only quote Alexander, who has used it successfully in the exhaustion of phthisis, and Schilling, who has found its value

to be very great in nearly all the severe infectious maladies. While it quiets nervous excitement, it seems at the same time to support the circulatory and nervous systems. In advanced typhoid fever I have found it very valuable. The doses I have employed have been 15 to 30 minims of a one to 15 olive-oil solution of the drug, given hypodermically, and resident physicians having seen its beneficial results in my wards have on a number of cases used it without my orders in urgent cases in which it has done good.

HYPODERMOCLYSIS FOR BURNS

Our knowledge as to the pathology of conditions and affections continues to advance not only in respect to new diseases but far more important in its relation to states which have been thought heretofore to be thoroughly understood. These advances are not alone of scientific interest, for they open up new possibilities as to treatment and explain symptoms hitherto unrecognized. A few years since the majority of medical men considered that the last new thing had been said about burns and their treatment, or at least that the pathologic results of burns were well understood. More recent studies have, however, revealed the fact that there is much to be considered in connection with burn cases over and above the local condition produced by the heat, the more deeply-seated secondary lesions and the shock from which the patient suffers. It has been found that a toxemia develops which is an important factor in destroying the patient's life, and that it is our duty to combat this condition quite as much as it is to treat the local damage. Time does not suffice in which to go over the whole experimental proof of these facts, and it is only necessary to quote some recent studies of Tomasoli, who injured dogs and rabbits by burning and then studied the effects of hypodermoclysis in aiding them in the elimination of toxins and the survival of shock. All the test animals which did not receive the saline solution in the manner named died within

48 hours of the injury, and Tomasoli found that blood-serum taken from these animals, being injected into a healthy dog, that animal will die. If, on the other hand, similar animals received saline injections, they nearly always recovered. Thus, out of ten animals which were burnt and injected, only two died, and these apparently from the direct injury rather than from toxemia, and serum taken from the injected dogs when injected into healthy dogs did not produce death as did that from the non-injected animals. Putting these facts to practical use, Tomasoli employed similar injections in cases of severe burns in human beings, using 500 to 1,000 c. c. of saline solutions and obtained good results therefrom. Whatever may be the ultimate decision in regard to these studies they open up for us an interesting line in practical research and promise of additional means of treating a serious medicosurgical condition.

INFUSION OF JUNIPER-BERRIES IN ANASARCA

Let me urge upon those whom I have the honor to address one fact in regard to therapeutics which it is well for practicians to remember when confronted with conditions which seem baffling, namely: that while much of the therapeutics of fifty years ago was crude and not in accord with modern views as to disease processes, much of it was good. We are so put to it to cure our patients and so constantly brought face to face with the fact that they are but mortals like ourselves, that we are apt to be off with the old love and on with the new. These facts were recently brought to my attention very forcibly by the following episode: A patient suffering from chronic renal disease with considerable anasarca, marked uremic amblyopia and the passage of a very scanty amount of urine heavily loaded with albumin, and containing very little urea in the 24 hours, was given several of the newer diuretics without any material effect. It then occurred to me to employ the old-fashioned prescription of an ounce of juniper-berries in a pint of boiling water, to which was added an ounce of potassium bi-

tartrate. The total amount was taken in 24 hours, when cooled, in wineglassful doses, with the result that in a few days the urine increased to a point beyond the ordinary in quantity, the anasarca began to disappear, the vision greatly improved and the patient passed the normal daily amount of urea. If this remedy had been new it would have been considered quite startling in its effects and widely used, if other cases fared as well under it, yet I venture to say that the use of other old remedies which we have discarded at least in part would be frought with equally good results when newer drugs fail.

IMPROVEMENTS IN THE METHODS OF PRODUCING ANESTHESIA

While the discovery of the anesthetic properties of ether and chloroform has been followed by the introduction of other agents capable of producing general anesthesia, it is an undeniable fact that our knowledge concerning drugs capable of producing this action both in regard to the action of old ones and the introduction of new ones, has been disappointingly scanty. Beyond the studies which have been made of the influence of ordinary anesthetic agents upon the respiration and circulation, we know little more today as to the method in which anesthesia is actually produced than did our predecessors fifty years ago, and no one has yet succeeded in inventing a substance which has any prospect of supplanting the common anesthetics which we all recognize have certain distinct disadvantages. In the absence of newer anesthetics it is well for us to continually be on the lookout for improved methods of administering the old ones, and while the majority of physicians are content with the crude methods of previous years, there are others of a more investigating turn of mind who have endeavored to devise methods which would remove many of the disadvantages associated with the older procedures. The number of inhalers which have been put upon the market for the use of ether and chloroform is very great, and

while their inventors have claimed for them very extraordinary advantages, it remains a fact that the simple Esmarch inhaler for chloroform and the Allis inhaler for ether are the only ones that have anything like universal recognition, at least in this country, and very many persons are to be found in the profession who freely state that the old-fashioned ether-cone and the administration of chloroform dropped upon a napkin still remain our most efficient methods of using these two drugs.

Within the last few years a number of physicians have employed the simultaneous administration of anesthetic vapor and oxygen gas and have found that this combination, particularly when ether is given, tends to prevent vomiting both during and after the operation; that cyanosis rarely occurs, and that the general progress of the case through the influence of the anesthetic is better than under the older methods. For the purpose of this double administration various forms of apparatus have been devised. In several of them the patient is provided with anesthetic vapor and pure oxygen gas alone. In others, and these are rarely met with, he is allowed to have some atmospheric air. In nearly all of the apparatus that we have seen the oxygen gas bubbles up through the ether or chloroform, which has been placed in a wash-bottle, and passes over to the patient's lungs, loaded with the vapor of the anesthetic. There are without doubt certain grave objections to this procedure for the quantity of oxygen provided to the patient cannot be increased without also increasing the quantity of anesthetic supplied to him. Neither can the quantity of anesthetic be increased without increasing the quantity of oxygen, and there are times in every operation in which it is desirable to increase or decrease one of these agents. Then, too, if too much oxygen is given, the respiratory center becomes benumbed by superoxygenation of the blood, partial or complete respiratory arrest follows, which is, in this instance, without any ma-

terial danger, but with the arrest of respiration it is impossible to give the patient more ether, as he does not draw it into his lungs. By far the best way to use oxygen when ether is given, and we think it always should be employed, if possible, is to allow the oxygen to bubble in the wash-bottle, thus passing from the cylinder which contains it to the ordinary inhaler, which is held over the patient's mouth and nose, the ether being poured upon the inhaler in the quantities which are needed, and the oxygen being supplied to the patient by slipping the tube under the edge of the inhaler by the patient's mouth and nose. In this way the patient receives the air which he ought to breathe, the anesthetic vapor and the additional oxygen which prevents the disagreeable symptoms which are so frequently met with. In no instance should that apparatus be employed which is now marketed by a number of instrument-makers, in which the patient exhales into a large rubber bag which is inflated with each expiration and deflated with each inspiration, the contents of which soon become surcharged with vitiated air, exhaled anesthetic vapor and impure oxygen. In all such procedures it is wise to let the patient breathe in as nearly a normal manner as possible and the more simple the apparatus the better it is for the physician and patient. When it comes to administering chloroform by passing oxygen gas through it, the objections are still greater. We are learning more and more each day that chloroform when exposed to daylight and the air is capable of undergoing certain degenerative changes and that the results of these changes are harmful to the patient. Further than this, in chloroform anesthesia it is often necessary to give the patient pure oxygen, but this cannot be done if this double method of passing oxygen gas through the chloroform liquid is carried out. Here, again, we believe that the chloroform vapor and oxygen gas should be kept separate and administered simultaneously or apart as the necessities of the case demand.

I desire to protest very emphatically against a habit which seems to be prevalent among young hospital internes, namely: of providing themselves with mouth-gags and tongue-forceps whenever they are about to anesthetize a patient. The writer has seen innumerable cases put under the influence of anesthetics and has made a study of these drugs for years. During that time he has never seen an instance in which it has been necessary to force the patient's jaws apart and keep them so by means of a mouth-gag, except, of course, in case of operations about the mouth, nor has he seen any instance in which it seemed to him justifiable to pierce the tongue of the patient by means of that form of tongue-forceps which is provided with one flat blade and one blade armed with two sharp teeth, which pass all the way through this organ, thereby puncturing and bruising it.

The proper manipulation of the head, jaw and neck in the presence of anesthetic accidents in the vast majority of cases is sufficient, and in some instances the forcing open of the jaws and the holding them open by means of the mouth-gag has seemed to aid in the obstruction to breathing by causing the relaxed tongue to fall back into the posterior portion of the mouth, just as it does in a person who is sleeping heavily with the mouth open. The writer mentioned this fact at a recent meeting of the Section on Surgery of the College of Physicians of Philadelphia and several surgeons who spoke after him agreed that there was rarely, if ever, except in mouth operations, any necessity for the use of these two instruments. They also stated that they had endeavored to find out, without success, who was responsible for teaching medical students their use during anesthesia, as they themselves never employed them nor directed their assistants so to do.

There is no doubt that the mouth-gag and the tongue-forcep is gravely abused, and even if they do no harm during anesthesia it certainly is unnecessary to cause the after-

suffering and discomfort in the mouth which the tongue-forceps often produce.

I desire to express my belief that it is a vital mistake for surgeons to urge upon their assistants the necessity of hurry in producing anesthesia. No physician would think of giving such an enormous dose of chloral that his patient would pass from a condition of wakefulness to deep sleep in the course of two or three minutes. Why should we employ such powerful and rapidly-acting drugs as ether and chloroform in such concentrated vapor as to almost instantly produce surgical anesthesia? If the anesthetics are given gently and gradually until the nervous system is benumbed and then pushed as hard as seems wise, disagreeable interruptions of the operation, because of threatened accidents, and accidents themselves, will be avoided, for the patient will not struggle and strain his heart and respiratory system at the beginning of the operation, and the general nervous system will be saved not only a large amount of nervous exhaustion, but be protected from shock. Those persons who have suffered from nightmare are well acquainted with the horrible nervous condition in which they find themselves on awaking, and in many instances the early stages of anesthesia, particularly to a timid woman, are like those of a dreadful nightmare. In one instance a woman who took ether told the writer that she had a delusion that someone was choking her to death, and in this delusion she was not very far wrong, as the writer saw the anesthetizer jam the ether-cone over her face and hold it there despite her violent struggles, which produced deep cyanosis.

The old saying, "Familiarity breeds contempt," is particularly applicable to the use of anesthetics. Surgeons are so apt to administer these drugs day after day and to be content with the recovery of the patient from the anesthetic on the operating table, or shortly after leaving it, that they entirely overlook these evidences of grave nervous shock which the physician or neurologist frequently meets with

after patients have been discharged by the surgeons as entirely well, so far as the operative procedure is concerned. There is reason to believe that with our advancing ideas in regard to the minute anatomy of the nervous system and our studies of the dendrites that at some time in the near future we will understand more clearly the minute physiologic action of anesthetic drugs, and then it will be easier for the surgeon to appreciate the grave functional change taking place in the nervous system when they are administered.

In conclusion the writer desires to call attention to the fact already alluded to by him a number of times and which was first called attention to by his colleague, Dr. Martin, and himself some ten years ago, namely: that the proper position for the head, when the patient is deeply anesthetized and it is desired to get a clear passageway for the air into the lungs, is in extension and somewhat thrown forward, instead of being extended and dropped backward from the end of the table. Extension and projection forward and backward both pull the epiglottis away from the glottic opening, but in the latter posture the soft palate is strapped over the dorsum of the tongue and the patient is forced to breathe through his nose, which is often partially or entirely occluded by mucus, by hypertrophies or by polyps. Whereas, if the head is extended and projected forward the patient can readily breathe through both the mouth and nasal chambers.

VASOMOTOR PHENOMENA

The last subject of which I shall speak is the importance of recognizing the vasomotor system as a factor in disease and in the production of disease. The average physician resorts to a careful examination of the heart-sounds and of the urine to discover the condition of the kidneys, and on the result of such tests rests the therapeutic procedure which he thinks is wise. If he be very careful he will, in an acute illness in particular, feel the pulse, but in doing so are

we not too apt to simply count it and pay little attention to its tension? As a matter of fact, the speed of a pulse is of little moment except as it indicates the arterial tension, and its quality is quite as dependent upon a proper vasomotor tone as upon a properly-acting heart. That a slow pulse is very often an evidence of high arterial tension, the heart beating slowly to overcome the resistance offered to the flow of blood, is well recognized, and the rapid pulse of collapse is quite as much, if not more, the result of dilated blood-paths than the failure of the inhibitory or vagus nerves.

The vasomotor system is a very definite and distinct part of the vascular apparatus, yet it is spoken of, as a rule, in a very indefinite manner in much the same manner that some practicians refer to the sympathetic system as a cause of an ailment without a clear idea of what they are describing.

It is to be remembered that the tonicity of the arterioles and capillaries offers a resistance to the action of the heart which is as natural as is the atmospheric pressure of fifteen pounds to the square inch on our bodies or in our lungs, and that any variation in this resistance by reason of dilatation or contraction of the blood-vessels is followed by as definite symptoms as ensue when we expose ourselves to rarefied air on the one hand or to compressed air on the other. The resistance offered to the heart by the properly-acting vasomotor nervous system, through its influence on the vessels, is identical with the friction offered to the driving wheels of a locomotive. The locomotive is meant to meet and stand this resistance, and if the resistance is removed by slippery rails the wheels fly around ineffectually, racking the machinery and destroying its usefulness. On the other hand, if the hill be too steep, the resistance is too great and the engine comes to a standstill or blows out a cylinder-head, though before such a thing occurs the mechanism is

much embarrassed, as is evidenced by the heaving impulses of the draught.

From this we learn some important diagnostic and therapeutic facts: First, that a rapid pulse may be due in no way to a disordered heart, but be due to vasomotor relaxation; and, second, that the proper way of treating this rapid pulse is to put sand on the track and increase the resistance, and not to make more steam—or give digitalis—which will only make the engine, or heart, work away on slippery rails with more wear and tear and make no progress.

Conversely, if a heart seems to be laboring against a high arterial pressure, the most sensible thing for us to do is not to stimulate this organ to increased and exhausting effort, but to eliminate the resistance offered by the grade, by making a cut, through which the heart may pump its way with normal resistance. This we do by the use of vasomotor relaxants, such as the nitrites, or by bleeding. Much of the reputation of nitroglycerin as a cardiac stimulant rests on the fact that under its influence excessive arterial resistance is removed and the heart has a chance to perform its work properly without direct stimulation.

When we consider the enormous space offered by the capillary area when it is relaxed, for the flow of blood or its stagnation, the facts I am endeavoring to emphasize become even more impressive.

It seems proper, therefore, that in every case to which we are called for heart trouble we should examine the tension of the blood-vessels before prescribing for the heart itself.

Let us take for study severally conditions familiar to us all, in which the heart is in reality intact and the vasomotor system really at fault, yet in which the heart usually gets the credit for the trouble. The most frequent of these is ordinary shock, in which, after the early inhibition of the heart by the irritated vagus (a state we rarely see, because

we do not see the patient soon enough), the entire group of symptoms indicates vasomotor relaxation in the soft radial pulse, the cold, wet, leaky skin, and the bloodless surface. Under these circumstances the heart beats fast and abortively to fill the yawning blood-paths, which have many times the area it is capable of filling, and soon fails from exhaustion.

Again, we frequently see attacks of tachycardia in which the heart, though strong and able, beats with excessive rapidity, resistance having been suddenly removed by vasomotor relaxation, as shown by the tension of the pulse. Frequently in nervous, hysterical women, sudden flushings or vasomotor palsies produce tachycardia.

Another state more like that of shock than those just named is the vasomotor relaxation of advanced acute diseases, such as typhoid fever or pneumonia, particularly the latter. Every one of my hearers must have seen cases of pneumonia in which after the crisis there developed a rapid running pulse with collapse and profuse sweating and with gasping breathing. Undoubtedly this state is partly due to the heart being exhausted by its work, and the loss of its stimulation caused by fever, but a large part of the symptoms are really due to the vasomotor relaxation.

Another evidence of general or local vasomotor relaxation is to be found in certain types of what has been called functional albuminuria, in which there is relaxation of the renal vessels so that they become engorged with blood and "leak albumin," to use a common phrase. Sometimes this state is due to heart-failure, but often to vascular atony.

Last of all we find more localized vascular atonies, such as are seen in certain cases of pelvic, respiratory or bronchial attacks of congestion or hyperemia, and which are sometimes provocative of severe colds or inflammations or the peculiar changes seen in their more severe forms in Raynaud's disease.

On the other hand, an equally familiar type is the man

who, by reason of renal disease or asthma, or both, develops a hypertrophied, over-active heart, with slow pulse and heaving impulse, as the results of the greatly increased arterial pressure against which the heart is laboring; in other words, develops an arterial tension in which the heart is overwhelmed by resistance or undergoes sudden and fatal or more slow and equally fatal dilatation of its walls.

It is wretched therapeutics to whip up such a handicapped heart by cardiac stimulants; you are simply exhausting the already fagged horse by whipping him up to greater but temporary effort.

Again, in the presence of dropsy we are apt to ignore the physical forces concerned in its development and the state of the vascular system, relying almost entirely, aside from efforts for its removal, upon cardiac and renal drugs, and ignoring the leaking vessels which produce the difficulty.

It will be remembered that dropsical exudation takes place from the capillaries, and that the integrity of the walls of the blood-vessels and lymphatics depends upon normal nutrition, or, in other words, upon a proper blood-supply. As a consequence, dropsy may be due to relaxed or poorly-nourished vessels as much as to any other cause.

The force exercised upon the column of blood as it is driven out by the heart into the aorta may be considered as the chief support of the capillary circulation, so that if the heart be weak the pressure falls in the arteries, and the rapidity of flow is decreased in the capillaries in consequence, while, on the other hand, an increased cardiac activity hastens the capillary circulation. As the arterial pressure and force depend not only upon the heart-force but also upon the tonicity of the arteries which carry the stream, it becomes evident that dilated arteries must lower blood-pressure even if the heart be strong, although practically the heart and vasomotor system generally fail or increase in tone together. We find, therefore, that either a weak

heart or a relaxed artery tends to cause stagnation of the blood in the capillaries, and having found that such stagnation is productive of exudation, it is not hard to discover why low arterial pressure is a cause of dropsy.

Having shown this to be true, let us turn to an explanation of the fact that a high pressure in the veins is productive of the same changes.

Here the normal pressure is almost nothing, being much less than in the arteries, and considerably less than in the capillaries. The result of this is that in health the blood flows rapidly from the high pressure of the artery to the low pressure of the vein, and passes through the small veins under a gradually decreasing pressure until it reaches the heart. Any obstruction to this venous flow must increase the venous pressure, and, the venous pressure being increased, the rapidity of flow through the capillaries must be decreased.

Having considered the conditions of vasomotor relaxation and spasm as etiologic factors in the development of circulatory changes, we come to the study of what we can do for their relief.

Let us take up the therapeutics of vasomotor relaxation. Here we find belladonna our standby and mainstay. I am as confident that I have saved life by its use in shock and in the collapse of acute disease as I am satisfied that I am here tonight. One case in particular always stands in my memory as a type of how much good these drugs may do. A child of five years, having passed through the earlier stages of pneumonia, rather uneventfully arrived at the period for crisis. On the day that crisis occurred it sat up in bed for an instant, although the pulse was already weak from the fall in fever, and at once called out: "Light the gas; it's getting dark," and then passed into profound collapse. The case was a desperate one, and, in addition to external heat, I gave hypodermically 1-50 grain of strychnin and 1-200 grain of atropin every fifteen minutes, till

three doses were used, when the child showed signs of renewed vitality, became flushed from the atropin, and eventually recovered without any further symptoms of note.

The good results following the use of belladonna in such cases have impressed themselves upon me again and again, and the resident physicians in the wards of which I have charge have repeatedly noted the change for the better on the use of the drug. One, at least, has contributed to the *Therapeutic Gazette* a report of the cases treated by this means, with the most happy effect.

There are other facts, in regard to circulatory changes produced by vascular dilatation, which are not to be overlooked. The most important of these is the peculiar capacity for holding and requiring large amounts of blood which the muscles possess. We all know that sudden or prolonged exertion makes us "out of breath" and causes more or less cardiac disturbance. At first this cardiac difficulty evidences itself in labored effort of the heart, because in the early period of muscular contraction the resistance offered to the flow of blood through the muscles is enormously increased. Very soon, however, we develop what has been called the "second wind," which is not wind, but vasomotor equilibrium. The muscle, at first anemic from squeezing out of itself, soon requires an excess of blood to nourish it under prolonged strain, and its blood-vessels dilate widely and become congested. The opening of these blood-paths relieves the resistance offered to the heart, and this organ therefore pumps blood without difficulty during the remainder of the exercise.

In these facts we have an explanation of sudden deaths occurring in cases of heart disease under exertion. The man with marked cardiac asthenia and dilatation falls dead when the resistance in his vascular system produced by exercise results in paralytic distention of his ventricular walls. Or the man with cardiac hypertrophy asociated with aortic regurgitation drops dead on ex-

ertion because the pressure makes a greater regurgitation than is compatible with life. Finally we hear of cases where the man has not fallen dead while exercising, but afterwards —that is, when his heart, exhausted by effort, suddenly is called upon to supply widely-opening blood-paths after brief effort.

In closing this address, I desire to thank this distinguished audience for its courteous attention and to express my thanks for the honor of addressing it on this important occasion.

MEDICAL EDUCATION FROM A LAYMAN'S STANDPOINT

ADDRESS OF HON. H. J. BOOTH OF COLUMBUS

AT THE BANQUET OF THE OHIO STATE MEDICAL SOCIETY, COLUMBUS, MAY 7, 1908

SUBJECT AND SPEAKER

What does a layman know about medical education? Very little. What are his opinions on the subject worth? Nothing, perhaps, except to satisfy curiosity. But the selection of the subject and speaker by your committee may have been made in deference to the homely philosophy of Burns:

> "Oh wad some power the giftie gie us,
> To see oursels as ithers see us."

You will excuse me for ending the quotation at that point, for a fellow-feeling makes us wondrous kind, and it was not long ago that your profession and mine, in the name of learning and justice, were burning incense at the same shrine of ignorance.

AN ILLUSTRATION

Let me illustrate. In the latter half of the seventeenth century two women, Amy Duney and Rose Cullender, were on trial for witchcraft at Bury St. Edmunds, in England, before Chief Justice Hale and a jury. They were charged

with laying spells upon a neighbor's children. The prisoners were not represented by counsel; but after the case for the prosecution had been practically closed, Mr. Sergeant Kelynge, a lawyer acting as *amicus curiae*, or friend of the court, declared himself not satisfied with the evidence. Thereupon, to strengthen the case against the prisoners, one Dr. Brown of Norwich, supposed to have deep skill in demonology, was called as a medical expert, and, after giving it as his clear opinion that the children were bewitched, added that "in Denmark there had lately been a great discovery of witches who used the very same way of afflicting persons by conveying pins into them, with needles and nails; and he thought that the Devil, in such cases, did work upon the bodies of men and women by natural inundation." The Chief Justice then briefly charged the jury, who, after a few hours' deliberation, returned a verdict of guilty against each of the prisoners; and to complete the medicolegal tragedy, the Chief Justice then put on the black cap, expatiated on the enormity of the offense, declared his entire satisfaction with the verdict, admonished the trembling old women to repent, and sentenced them to die. They were accordingly executed; and Chief Justice Hale, who was called "the ornament of his Majesty's government, and the honor of England," has left on record in his journals that during the religious services of the following Sabbath he enjoyed unwonted spiritual calm and consolation because of his righteous judgment.

That case, which proves how faithfully professional men may reflect the ignorance and superstition of their times, was a fitting *finale* of a long list of executions for witchcraft in that country which for five hundred years has claimed with much reason to be in the vanguard of human progress. And Hale was the same Chief Justice, too, who had refused to discharge from prison the poor tinker, John Bunyan, who, while shut in by gloomy walls, wrote that immortal allegory which he was peopling with the children

of his rich imagination, while his more favored countrymen, the learned expert, Dr. Brown, and the distinguished Chief Justice, Matthew Hale, were enjoying the honors and emoluments of their professions. In humility let us remember that those dramas were played nearly a century after Sir Edward Coke had laid the foundation for his Institutes, and more than a hundred years after medical men were made competent expert witnesses in Europe.

FROM DARKNESS TO LIGHT

But since the time when those who had sore eyes invoked St. Clara, those who had inflammation elsewhere turned to St. Anthony, and those who had ague sought the aid of St. Pernel, the art of healing has been passing from darkness to light through growth and development, towards the firm ground of scientific knowledge. Prescribing "sulphur and supplication" for fever and Virginia Skull-cap for hydrophobia, drawing a line about Black Hellebore to insure its efficiency, searing the flesh with a hot iron in cases of amputation, and the copious use of mercury for yellow fever, calomel for consumption and fox-lungs for asthma, have been stepping-stones from the ignominy of Dr. Brown to the triumph of Sir Joseph Lister. For the witches of the former have been exorcised, and asepsis, or the scientific demonstration that "cleanliness is next to Godliness," is the crowning glory of the latter. And while his title of Baronet, so recently conferred by Queen Victoria, was most worthily bestowed, to the honor of our race be it said it was but the shadow of the laurels already placed by a grateful world on the brow of a man who, in a single generation, passed from a minority of one to the kingship of his craft.

EDUCATIONAL REFORM

One of the most interesting of all the sociologic phenomena of the present decade is the agitation for educational reform. Whence comes the impulse? Whither is it tending? What will be the result?

This is not the time nor the place to discuss the causes. History marks a new epoch with every stride, but the anatomy of history is beyond our ken. The mainsprings of action in communities and states lie "farther down than gold lies hid."

GROWTH OF HIGH SCHOOLS

America, and by that I mean the United States, the leader of American progress, is in the midst of a revolution, which vitally affects especially the high schools and professional schools of the country, and is felt in nearly all others. Figures are dry, but let me state a few facts and figures which show in part, and very briefly, both the extent and the significance of the new movement.

In 1889-90 the number of pupils in the public high schools of the country was 202,963; in 1895-96 it was 380,-493, an increase in six years of 177,530 or 87 percent. During the same time the attendance at private high schools increased from 94,931 to 106,664, or a little more than 12 percent. The aggregate attendance in 1889-90 was 297,894, and in 1895-96 it was 487,147, showing an increase in round numbers of 190,000, or an annual increase of more than 31,000. If we add the attendance at other so-called secondary schools, those who pursue secondary studies in elementary schools and a *pro rata* growth for the last two years, a fair estimate of the total number of secondary students in the United States during the present scholastic year would not fall short of 675,000.

THEIR DISTRIBUTION

The public high schools are distributed throughout every state and territory in the Union. This newly awakened spirit knows neither latitude nor longitude in the dispensation of its generous bounties. Hence we see the youth of our land studying the classics, higher mathematics and the sciences, alike under the shadows of the pine and of the

palmetto, on the rolling prairies of the West and amid the sage brush of the farther West, from the sun-kissed Savannahs to snow-capped Tacoma, and from esthetic Boston to cosmopolitan San Francisco.

RURAL SCHOOLS

The high schools are no longer confined to the cities and villages, but are already in a flourishing condition in many rural communities where their advantages are eagerly sought by rapidly increasing numbers. They do not find their best patronage in the great cities. Our state has no large commercial metropolis, no great congested center of population where vice and ignorance fester under the shadow of Dive's palace. In the sisterhood of states Ohio stands only fourth in relative population. Therefore we may well refer with pride to the fact that her public high school attendance exceeds that of any other state, as shown by the statistics for 1896, when the following states stood at the head of the list:

GRADUATES

Pennsylvania	3,393
New York	3,623
Illinois	3,815
Massachusetts	4,005
Ohio	4,679

ATTENDANCE

Iowa	23,779
Massachusetts	28,627
Illinois	29,526
New York	34,206
Ohio	36,299

THE LENGTH OF COURSE

The National Educational Association, composed of prominent representatives of our public schools, for several years has been doing a grand work in its efforts to elevate the standard of our high schools, multiply them in country

districts, and make them uniform in curriculum and length of course, so that the high school may be, as it ought to be, the recognized unit of value in the work of preparation for entrance into both literary and professional colleges. The leaders in this movement are as determined to make four years the standard and recognized high school course as the members of your profession are to make a like period the standard in medical colleges.

THE BRANCHES TAUGHT

Thus we see offered to our youth, in city and country, instruction in languages dead and languages foreign, algebra and geometry, trigonometry and astronomy, physics and chemistry, physical geography and geology, physiology and psychology, rhetoric and history. Many of the high school pupils seem to have designs on your profession, for we find 44,000 of them studying chemistry, 151,000 studying physiology and 225,000 studying Latin. These figures do not include the large number of pupils who study those branches only in grammar schools, nor the natural increase of the last two years.

PROFESSIONAL SCHOOLS

The figures which relate to professional schools show how rapidly prescriptive ignorance is yielding to the demand for special training. On this point statistics covering the period from 1880 to 1895 speak eloquently and conclusively.

SCHOOLS OF PHARMACY

Students in schools of Pharmacy numbered:

In 1880	1,347
1885-86	2,063
1890-91	2,884
1895-96	3,873

showing an increase during the last ten years of about 90 percent.

DENTAL COLLEGES

Students in schools of Dentistry:

In 1880	730
1885-86	1,552
1890-91	3,016
1895-96	6,399

showing an increase during the last five years of that period of more than 100 percent, and during the last ten 340 percent.

MEDICAL COLLEGES

Students in Medical Colleges:

In 1880	11,929
1885-86	12,273
1890-91	18,160
1895-96	24,437

showing an increase in the last ten years of 100 percent, while during that period the number of physicians increased only 22 percent.

LAW SCHOOLS

Students in Law Schools:

In 1880	3,134
1885-86	3,054
1890-91	5,258
1895-96	9,780

showing an increase in the last ten years of 220 percent, while during that period the number of lawyers increased only 36 percent.

REFORMS IN MEDICAL EDUCATION—PROBLEMS INVOLVED

Your profession and mine, medicine and law, are seeking to promote similar reforms, or, to be more accurate, both are striving for self-improvement by similar methods. One is cursed by pettifoggers, the other by quacks and charlatans. But both are seeking to make the doors of admission "swing more reluctantly on their hinges." The chief purpose of a medical college should be to thoroughly equip

men to practice medicine, and to admit those only who are duly qualified and reject those who are not.

What are the controlling factors in working out these problems of medical education?

1. A matriculation qualification which shall be definite, uniform and a fair measure of the necessary preliminary education.

2. A course of instruction which shall meet the public demand for physicians and surgeons, not for those who are simply M. D.'s, or mere theorists.

3. A thorough examination by a State Board composed of men who are both competent and disinterested.

SOURCES OF OPPOSITION

Who oppose these demands? The opposition comes chiefly from the following sources: (1) the quacks and charlatans, because such standards disqualify them; (2) diploma-mills, because such requirements destroy their business; (3) low-grade colleges, because such standards diminish their profits; and (4) a small, but well-meaning element of the profession, for no especial reason except, perhaps, that, being victims of an old and well-defined disease called "mental inertia," they are opposed to any change on general principles. There are some others, men of standing, too, who find themselves arrayed on the side of the quacks and diploma-mills because they believe that, although the standards are correct, the time has not come to apply them. They remind me of the man who remained seated when the revivalist asked all those to rise who wished to go to Heaven. When the preacher asked him if he didn't wish to go to Heaven, he replied, "Yes, but not just yet."

LAW AND MEDICINE—PARALLEL LINES

I trust you will excuse plainness of speech on this subject, and not consider it mere impertinence on the part of a disciple of Blackstone, when I remind you that the Amer-

ican Bar Association and the American Medical Association are, on this subject, working along parallel lines. In fact, in the objects to be accomplished, the opposition encountered, and the progress made, the efforts of these two associations to establish standards of admission to practice are so nearly alike that the similarity cannot be considered a mere coincidence.

As interpreted by their committees, it is the policy of both to make the high school diploma or its equivalent a condition of matriculation. But one treats a knowledge of Latin as a mere incident, the other regards it as essential. The lawyers quit trying to use Latin as a common vehicle of thought a long time ago. But the doctors still write *spiritus frumenti* when they mean whiskey, *vini gallici* brandy, *cataria nepeta* for cat-nip, *tinctura opii* for laudanum and *tinctura opii camphorata* for paragoric. We may assume that this is proper in writing prescriptions, but I haven't heard any doctor here calling for *spiritus frumenti*, and if any of you should summon a waiter and order *vini gallici*, he would be considered pedantic, or drunk, or, possibly, a Spaniard—I mean the doctor, not the waiter. But I wonder what the doctors do in Connecticut, where the law provides that "All physicians or surgeons * * * when requested, shall write a duplicate of their prescriptions in the English language." People who were so long engaged in the wooden nutmeg business, propose, when they receive a prescription for *sodae biboras*, to know whether they are getting borax, or something else. They may fool others, but they don't propose to be fooled themselves. How can a Connecticut Yankee know whether he is paying too much for a prescription of *zingiber officinale*, unless he knows whether or not it means ginger?

I fear that my knowledge of Latin is almost as superficial as that of the lady who said that the only old Latin names she could remember were *Aurora Borealis* and *De-*

lirium Tremens. And my pronunciation of the language is so out-of-date that I find myself in about the same situation as Bob Burdette. His son was attending high school where he had been studying Latin several terms. At the time from which the story dates he was studying Cæsar, or "Kaiser," as they call it now. Bob offered to review the work with his son, opened the book and read:

"Veni, vidi, vici."

"What's that?" said the son. "Why," said Bob, "that's the Latin for: "I came, I saw, I conquered." "Read it again," said the son, "and read it slow." The father repeated it more slowly. "Now," said the son, "let me take that book and see what you're trying to read." Glancing at the sentence, he uttered something which sounded like "Weeny, weedy, weechy." "What's that?" said Bob. "Why, that," said the boy, "is the Latin for 'I came, I saw, I conquered.'" Said Bob: "Say that again, and say it slow." The boy repeated "Wee-ny, wee-dy, wee-chy." Said Bob: "My son, is that the way the old Romans talked?" "Yes," said the boy. "And did Cæsar talk that way?" said Bob. "Yes, father," said the boy, "that's just the way Kayser talked." "Well," said Bob, "I never knew before just why it was that Brutus killed him." And so ended the lesson in Latin.

But to return to our subject. One association calls for a four years course, the other for a three years course. But the average annual course of the law school is about one-third longer than that of the medical college. And last, although possibly not least, both professions favor examinations by State Boards whether the applicants have diplomas or not. And in many states both have been successful, although not always in the same states.

ENTRANCE QUALIFICATION

If the medical profession aspires to remain, as it claims to be, and ought to be, as learned as any other, why should

it not insist that its students have at least an academic education? That it is an advantage no one will deny. That reasonable opportunities are offered to obtain it in the public schools there is no reason to dispute. Then why adopt an entrance qualification as elastic as a political platform? Why not adopt one that is definite, uniform and sufficiently high, and then enforce it? The medical colleges can answer. Some of them are answering at the bar of public opinion now. And they should be made to answer before a public tribunal clothed with power to correct the evil, and supported by your profession in the discharge of that duty.

INSTRUCTION REQUIRED

After matriculation, what? During the last few years there has been a revolution in both professional and public opinion as to what constitutes a medical education, and in professional opinion, at least, as to the best methods of imparting such instruction. It is quite a step from the old hand-me-down diploma to a four-years' course, from the lecture to the laboratory, from the quizz-class to the clinic, from hearing to seeing, from seeing to doing, from theory to practice; as great almost as from the tallow-candle to the X-ray. The new departure in teaching medicine has been vigorously resisted. The victory of progressive ideas has not been won without a struggle. The readjustment has caused friction; but in Ohio and many other states organized resistance is at an end. Vain regret still pays to the old régime the tribute of a parting tear, for error is never too old to seek to hide the wrinkles in her face by covering them with the flowers of sentiment. But let the dead past bury its dead. Let those, who will, tarry briefly to mourn the lost cause, if they linger not too long after their profession has turned its face from the setting sun of ultraconservatism towards the rising sun of progress, from the twilight of the past to the dawning of a better day.

EXAMINATION VS. DIPLOMA

Viewed as a whole, American statutory law relating to the licensing of doctors to practice looks like that abomination the ladies call a crazy quilt. The statutes on this subject resemble the game laws of New York under which, at a given time, it is a misdemeanor to fish from one bank of a stream and perfectly lawful to fish from the other, that is, when the stream is the boundary line of two counties. Whether a man is a mountebank or a physician in good and lawful standing depends upon where he is. If he doesn't know anything about medicine, it is all the more necessary that he understand medical geography. If he wishes to practice in some of the states he must pay one dollar and present a certificate of good moral character. But in order to practice in the Indian Territory, among the Choctaws, applicants must pay twenty-five dollars, present a certificate of good moral character and pass an examination before a Board, or present a medical diploma. The white man puts a premium on ignorance, the red man taxes it. The devices to which various states have resorted to temper the wind to the shorn lamb are about equally interesting, amusing and instructive. Lack of time forbids an attempt to show by analysis and comparison their incongruities and absurdities.

But one fact is so significant, and the cause behind it such a menace to the honor of your profession and the welfare of the public, as to justify a moment's consideration. In this country there are about 150 medical colleges of alleged good standing. In 40 states and territories, having a population of about 43,000,000, diplomas of medical colleges are not conclusive evidence of fitness to practice; while in 20 states and territories, having a population of about 31,000,000, such diplomas are accepted as conclusive evidence of that fact. But the 43,000,000 of people, distributed among the 40 commonwealths, have only 61 medi-

cal colleges, while the 31,000,000, distributed among the 20 states and territories, have 89 medical colleges, and Ohio is in the latter class.

But why do states having three-fifths of the medical colleges and only two-fifths of the population, give medical colleges such power? Tennessee has a population of only 1,767,000. What need has she of ten medical colleges, while Pennsylvania, with a population of 5,258,000, supports only six? Why does Tennessee maintain, or at least tolerate, one for every 176,000 of her people, while Pennsylvania supports only one for every 876,000?

Pennsylvania requires a state examination. Tennessee does not. Why? Let the Tennessee medical colleges answer. Massachusetts requires a state examination, Ohio does not. Why? Massachusetts, with a population of 2,238,000 has only four medical colleges, while Ohio, with a population of 3,672,000, has thirteen. As charity begins at home, we should not be too curious about this remarkable juxtaposition of facts. Such startling contrasts are not due either to latitude, longitude, religion or politics. In this respect the medical colleges take no heed of Mason's and Dixon's line, but exert their baleful influence on both sides of that historic boundary. Texas has a territory four and a half times larger than Illinois and a population about three-fifths as large. Texas has two medical colleges, Illinois has 16. Texas requires a state examination, Illinois does not. Alabama, Louisiana, Minnesota, Mississippi, New Jersey, Virginia and West Virginia have a population of more than 9,000,000. California, Colorado, Kentucky and Missouri have a population of a little more than six millions. The seven former states have 9 medical colleges, the four latter have 32. The former require a state examination, the latter do not.

With rare exceptions, the states that are cursed with the largest number of cross-roads or back-alley, low-grade medical colleges, make their diplomas indisputable proof

of competency, while those whose colleges are relatively of a high grade and few in number require a further test. In other words, the law has advanced in inverse ratio to the number of colleges. As Hancock said of the tariff, it is made a local issue. And the homes of the low-grade colleges seem to act on the theory that they ought to protect home industries, or home manufactories, if not by imposing a tariff, at least by offering a bounty.

It is very natural and not unreasonable for the doctors to tell the lawyers to take the beams out of their own eyes. But in Ohio this beam has been out for several years, and the result is very gratifying. In this state all applicants for admission to practice law must submit to an examination by a committee, or examining board, appointed by the Supreme Court, and no exception is made even in favor of graduates of the law department of the State University, whose instructors include several members of the Supreme Bench. All are treated alike, whether they come from the law office or the law school. And that the law is strictly enforced may be inferred from the fact that at the last examination more than fifty percent were rejected.

STATE BOARD

You have a State Board composed of excellent men, but its powers are too limited. Unless its authority be enlarged, Ohio will continue to be a dumping ground for the charlatans of other states. By no other means can you so easily and so effectively elevate the standard of your profession as by vesting that Board with ample power to accomplish the purposes for which it was created. If permitted by positive law and sustained by the cordial cooperation of the profession, it will eliminate from your ranks the ignorant pretenders whose mendacious advertisements, made conspicuous by their physiognomies, are a reproach to you, and a source of danger to the public. Armed with a diploma, they laugh at the impotence of the Board to expel

them from a profession which they disgrace. By ill-gotten gains they may buy from the press the immunity of its silence, and from the paid lobbyist his active and pernicious influence; but no General Assembly of Ohio will ignore the reasonable, earnest and united demands of the reputable physicians of this State.

NEW ISSUE

You will soon have another issue to meet. Some of the sea-board states are already committed to the policy of matriculating only those who can present college diplomas. When will Ohio, dotted all over with colleges, at the head of which stands a great University, take her natural place with her sisters of the East? It will be a great step in advance. The time is not yet ripe, but it will come as a consummation of hopes already born. It seems no more remote than did other reforms, now secured, a half-decade ago. Some of the silver-grays about this festal board will live to welcome it. "All things come to those who wait." But they come more quickly to those who strive. The wisest know not how long the fagots of thought must be prepared before the match should be applied. But we do know that revolutions of methods and systems, coming slowly as the glacier, suddenly sweep all opposition before them as the avalanche. The revolutionary sentiments of our "forest-born Demosthenes," received with cries of "treason," were soon embodied in the Declaration of Independence. From the Dred Scott decision which riveted the bonds anew, to the proclamation which broke them, was but a brief period of six years; and but a little later from out of the throes of fratricidal contest emerged a purified and reunited people.

THE WORLD MOVES

And the world still moves. After centuries of lethargy, Japan, Phenix-like, shakes off the blight of Asia. In India idolatry and caste are fast disappearing before the magic

touch of modern civilization. Chinese immobility yields at last to the forces of the living present, and humanity sheds no tears, though it be the spirit of conquest that aids in redeeming countless millions from hopeless misery. And even Africa, whose history for two thousand years has been a succession of tragedies, feels the impulse of modern enterprise, and through the eyes of hope sees visions of future greatness and glory.

CUBA

But at our own doors, amid the din of arms, we see one of the most recent evidences of the fact that the world does move. Two countries lie within 70 miles of each other, one blessed with liberty, the other cursed with despotism; one of them rich, free, powerful, the other mourning her dead in the ashes of her desolation and starving under an edict as senseless as it was cruel, a relic of barbarism cursing the new world. Blessed with almost everything except good government, her brave people again and again sought to achieve their independence. To their appeals for aid, or even recognition, we turned a deaf ear. But when the infamies of Weyler were emphasized by the awful calamity in the harbor of Havana, we awoke to a sense of our duty. The loss of the *Maine* and her crew was a fearful price to pay for quickening the American conscience. Yet it was not an unmixed evil. It turned the eyes of the world to a scene unparalleled in modern history. The world stood aghast. The result is already foreshadowed, for America, united in the presence of a grave duty, is discharging for humanity a great service, in harmony with her traditions, and demanded by every consideration of justice.

Not for love of conquest or fleeting glory has the purple testament of war been opened. From this contest the world shall learn a noble lesson. Ours is the mission not only to stay the hand of oppression at our own doors, but, also, to add a new principle to International Law. That Sovereign-

ty has no prescriptive right to commit crimes which humanity can avert, is the latest tenet of the world's jurisprudence, as it is also the best. It was promulgated last Sunday at the Island of Luzon by American valor. It will command the respect and ultimately receive the support of all nations. Commissioned by the God of Justice, the voice that spoke in the harbor of Manila will speak again wherever its authority is denied.

But,

When that voice speaks again, saying: "Cuba is free
From the blight which has cursed that fair pearl of the sea,
When her rights are assured, and her wrongs are redressed,
And white Peace folds her wings o'er the Isle of the Blest,
Once again shall the beautiful birds of the South
Build their nests without fear in the cannon's grim mouth."

CHAPTER IV

SURGERY

THE SURGICAL TREATMENT OF TUBERCULOSIS OF THE PERITONEUM

BY C. M. LENHART, M. D., ZANESVILLE

Visiting Surgeon to Zanesville City Hospital, and to the B. & O. R. R., etc.

The following is the clinical history of a case of tubercular peritonitis which is one of great interest to me, showing how slow is the invasion of this disease in some cases, without the ordinary symptoms that are laid down in our text-books.

I was called November 3, 1894, to attend Mrs. B., white, aged 33 years. Found her in her third pregnancy, between the seventh and eighth month, with no history of miscarriages. The patient has always enjoyed excellent health and appears healthy at this examination excepting a diarrhea for two weeks past. The diarrhea could be checked only for a few days and continued through her entire illness. She was delivered December 23, 1894, of a healthy baby. Her recovery was uninterrupted and the secretion of milk was normal. In the fourth month of her sickness a thorough examination was made of all the different organs of the body and they were found healthy, but the patient is slowly losing flesh and strength. No permanent benefit has been derived from treatment. She has slight abdominal pains, not localized or severe enough to call for an opiate. In the fifth month a slight swelling was discovered over the region of the appendix, slightly tender on firm pressure. The case was now thought to be appendicitis, with probably the formation of an abscess discharging into the bowels;

in such a case we would have diarrhea, probably alternating with constipation and such was now the condition of our patient. This swelling diminished but never entirely disappeared. An operation was proposed but was not consented to.

In the seventh month of her sickness the woman had become very weak and greatly emaciated; strength failed her very rapidly; temperature from 97½° in the morning to 99° in the afternoon under the tongue. Pulse 100 to 120. She took large doses of morphine to relieve the abdominal pains. Her bowels were now obstinately constipated.

Our patient now consented to a laparotomy which was done at the Zanesville Hospital, June 17, 1895, by the abdominal surgeon of that institution.

The appendix was found inflamed and a hard particle of fecal matter was found in it after its removal. About a half-pint of serous fluid was drained from the peritoneal cavity. The peritoneum was found studded with hard miliary tubercles. The other abdominal organs were found normal. She made a rapid recovery, gaining her appetite and strength. Her bowels became regular and her health improved in every way. It is now nearly three years since the operation and her health continues good.

A subnormal temperature was frequently noted and it appears that subnormal temperature for weeks or months is frequent in cases of fibrous tubercles where there is slight inflammation and small effusion or there may be slight fever alternating with subnormal temperature.

A large proportion of all the various forms of tubercular peritonitis are cured or are greatly benefited by a simple laparotomy with the removal of exudate. Why so simple a treatment produces such radical changes in this disease is remarkable and without analogy in the whole domain of surgery. Many theories have been advanced explaining this phenomenon, but as yet none can be demonstrated to be true. The cause may be that which Tait has

arrived at, that when the abdomen is opened a physiologic change is produced in the peritoneum which enables it to overcome and destroy the tubercle bacillus.

In operating, the serous or purulent exudations should be drained out and the abdominal cavity thoroughly dried with sterilized gauze and not irrigated with saline or other medicated solutions. Many authorities advise drainage of abdomen, but it is better to completely close the abdomen at once, for when you establish drainage a permanent fistula often results and a delay in the healing of wounds is always a serious thing for these patients.

It should be remembered that in all the early cases reported a cure resulted from a simple exploratory operation where probably the nature of the disease was not recognized until after the abdomen was opened, then the case pronounced incurable, the abdomen closed, when, to the surprise of the surgeon, his patient recovered.

The cases most likely to be benefited by operation are those similar to the one presented, and also those accompanied with considerable exudation either free or encysted. Such cases are most likely to be primary in the peritoneum and the general condition of the patient is usually better. In cases with purulent and large caseous masses in the peritoneum the prospect for recovery is less hopeful, but many cures are recorded and surprising results often follow abdominal section. In the chronic adhesive form of this disease where there is little or no serum or purulent exudate and coils of intestines are matted together with large caseous masses, little or no benefit can be expected to follow an operation.

In children the infection appears to pass from the intestines, and from the same source where the patient has chronic phthisis, while in women the infection frequently comes from the Fallopian tubes and in men often from the prostate or seminal vesicles. When the abdomen is opened these parts should be examined particularly and if found

affected the original source of infection should be entirely removed and the caseous masses scraped out.

This disease may be latent through its whole process and not have a single symptom; or, in contrast, the onset may be so sudden and violent that a diagnosis is made of acute enteritis or peritonitis, or of strangulated hernia and be operated upon, or that of typhoid fever has been made.

Where advanced pulmonary phthisis or acute miliary tuberculosis is associated with the peritonitis the operation should not be done.

In preparing this paper I have quoted some from a former article I wrote in the *Medical Record* for October, 1895.

INTESTINAL OBSTRUCTION, OPERATION AND RECOVERY, WITH REPORT OF CASES

BY SHERMAN LEACH, M. D., COLUMBUS

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My reasons for presenting this paper, together with the report of one or two cases, is not so much for the purpose of adding anything new in the management of such cases, but rather to condemn a practice which has long existed, and is yet in vogue to a great extent. The common error made by the profession is to trust to the use of drugs to relieve the condition present until fatal peritonitis has developed, at which time the surgeon is usually called, with the hope of saving life, but alas! too late.

Drugs play an important role in the treatment of such cases, but their sphere of usefulness is of short duration, as by their use we often continue their administration beyond what should be strictly prescribed limits, hoping and expecting their action will soon be realized.

If, in obstruction of the bowels, after due trial with

various remedies and a well-directed effort to get the bowels open you should fail, do not delay opening the abdomen.

There should be little difficulty experienced in making up our diagnosis, in so far as obstruction is concerned. But the cause may be a very difficult, and even an impossible problem to solve, and may require very careful examination along differential lines and many times we will find ourselves groping in the dark.

If we have a history of constipation dating back a few months, requiring the constant administration of drugs to relieve the same, and along with this some colicky pain and distention of the bowels—if in such an individual symptoms of obstruction should develop there ought to be no delay in opening the abdomen, for in all probability we have some new growth or inflammatory bands to deal with and, with acute symptoms coming on, we should not delay but operate immediately before peritonitis renders the case a hopeless one. Again we meet a number of acute cases, where the cause cannot be surmised, yet the symptoms are more pronounced than in the other class. But we have no previous history whereby we can arrive at anything like a plausible opinion. This, like the other class, should not be dallied with, trusting to nature and drugs, but should be given the benefit of sound, rational, conservative treatment—by opening the abdomen. If, after opening the abdomen, the cause is one which cannot be removed, we can prolong life and make our patient fairly comfortable by establishing an artificial opening, or closing the abdomen, as the case may be. We have done our patient no harm if we have observed the general rules governing such operations.

But on the other hand we have given our patient the benefit of the doubt, and the cause which, a few moments before, was obscure, is now, in most cases, perfectly plain. If we have not deferred the operation until peritonitis has already set in, with the abdominal cavity half-filled with peritoneal effusion, our patient will, in the majority of cases,

be saved. Neither is the surgeon excusable for the manner in which he always conducts such cases. In most instances when called, instead of putting about to arrange a room for the operation in the patient's home, he at once advises the removal of the patient to the particular hospital with which he is connected, thereby incurring additional risk. No community is beyond the reach of well-trained, educated, and efficient nurses, who understand perfectly well what is required by way of preparation for an abdominal operation. Furthermore, there is no room (with but few exceptions) that cannot be put in as good condition, insofar as cleanliness and asepsis is concerned, as the best equipped operating room in the average hospital. With the means then at hand for doing aseptic surgery, either in or out of a hospital, I do not believe we incur any more risk in opening the abdomen than does the dentist in extracting a tooth.

My personal experience with obstruction is limited to a few cases, yet they have served me a very useful purpose and bear me out in the stand I have taken. Could I have subjected every case to operation I feel sure my mortality would have been lower.

When we come to fully realize that peritonitis may develop and prove fatal within a few hours, then, and not until then, will we be conscious of what early operation signifies. I dare say there is not a member present who cannot look back over his past two or three years' work and recall to his mind several cases of obstruction from various causes, which have proven fatal, while he quietly stood by giving the usual remedies, hoping to relieve same, which hope has proven entirely erroneous at the necropsy.

Our duty, then, toward such cases, ought to be well understood. Our efforts should be directed towards overcoming the prejudice which exists in the minds of the laity, and, I am sorry to say, in the minds of many physicians, against operative interference.

To sum up, then, the proper course to pursue in such

cases, I should say that after due trial with the various remedies, calomel, oil, salines, aided by rectal enemata of various kinds, if you fail to get the bowels open, and any symptoms of obstruction exist, do not delay. Prevent peritonitis by operating at once, without waiting for symptoms of peritonitis. Peritonitis once present, the chances of recovery are very few. Do not delay to open the abdomen that we may both feel and see. A disease that can be felt and looked at is generally easy of diagnosis. When once correctly diagnosed, the proper line of treatment is plainly indicated.

Deaver says that he professes to know but two things in regard to appendicitis, one of which is that the disease is appendicitis and the other that the appendix should be removed. I would apply the same phrase to intestinal obstruction—first know that you have intestinal obstruction, and, second, open the abdomen and do what is to be done. By following such lines of treatment we will take nothing for granted. We will not be continuing the administration of drastic cathartics in opposition to rational surgery, but will view them in the true light.

The following cases illustrate the points taken very well and should cause us to stop and reflect:

Case I. Edith R., age 3 years, family history negative, health since birth ordinarily good, except during the past year has suffered several attacks of digestive disturbances characterized by slight fever, constipation, loss of appetite, which were quickly relieved by appropriate treatment.

On February 21, 1897, I was requested to see the child for the first time. I found her suffering from what I presumed was one of her usual attacks of indigestion. Her bowels had moved irregularly the few days preceding. She was a little peevish, her tongue was heavily coated, her pulse was quick, her temperature was 99°, and she complained of no particular pain. I prescribed for her some calomel, on general principles, fully expecting I would not

need to see her again. However, the next morning, February 22, I was again called. Her bowels had not moved, and she complained of pain in the right iliac fossa. She had vomited occasionally, her bowels were slightly distended, her temperature was 100° and her pulse 120. At this time I discovered a mass occupying the region of the appendix, immovable, very hard and painful on pressure. I continued calomel, together with enemata of various kinds. Her condition continued to become more alarming, symptoms of great gravity developing. I accordingly advised immediate operation, which was vigorously opposed by the grandmother who assured me that there was nothing but a wad of worms present and that sufficient physic would bring them away.

On February 23 Dr. W. L. Dick was called in consultation. Her condition was unchanged for the most part, except the tumor was slightly movable, very painful, hard, and about the size of a hen's egg. Vomiting continued and the bowels becoming quite tympanitic, Dr Dick fully concurred in advising and urging immediate operation, which was made on the morning of the 24th, seventy-two hours from the time of the first visit. The abdomen was opened in the median line. The intestines were found slightly congested and inflamed, and there was a small quantity of peritoneal effusion. The obstructing agent was quickly brought to the surface and proved to be a dermoid cyst of the right ovary with a pedicle of sufficient length to allow it to become wound around the head of the colon in such a manner as to entirely occlude the gut. This was easily removed in the usual way, the abdomen was closed throughout with catgut and sealed with iodoform-collodion dressing. The case made an uninterrupted recovery, the bowels moving freely the day of operation.

Case II. D. M., male, aged 36, father supposed to have died of cancer of the stomach, otherwise family history negative. History: For six months preceding the present

attack he had suffered habitual constipation, requiring the constant taking of drugs to relieve the same. His family physician had dilated the sphincter together with some orificial work, all of which did no good. On July 20, 1896, he presented himself at my office with a history that his bowels had not moved for the forty-eight hours preceding and that he was suffering from pain diffused over the entire abdomen and intensely severe, so that he was compelled to stop on his way to town to assume the knee-chest position to try to get relief. I examined him carefully but was unable to discover anything to account for his pain. I gave him ½ lb. Rochelle salts, directing him to take a teaspoonful every hour until the bowels moved. In addition I had him use copious enemata of glycerin, hot water, etc., and instructed him to report next morning. July 21 his condition was unchanged. He had persisted in the above directions, taking all the salts and frequently repeated enemas in the knee-chest position. The pain was severe, the abdomen was distended and the pulse and temperature were normal. An ice-pack was used to control the pain.

July 22 his condition was very much the same. Everything was prohibited by the stomach except the water. There was no vomiting, the temperature and pulse were normal, he was exceedingly restless, the pain was still intense, and meteorism and borborygmus were marked. Operative interference at this time was not consented to, although strongly urged. Treatment continued with enemata, massage, etc. From July 23 to 25 his condition continued to grow more serious, symptoms of peritonitis being marked. Vomiting developed. The pulse ranged from 110 to 120, there was no fever, but the facial expression was very anxious. At this time the patient realized his only hope was in a surgical operation. Dr. J. F. Baldwin was called in consultation on July 25, when we gave him sufficient amount of chloroform to relax the abdominal muscles in order that we might endeavor to locate some point of obstruction, but this proved negative.

Consequently early next morning, the tenth day of obstruction, his abdomen was opened by Dr. Baldwin, assisted by myself. The abdominal cavity contained about one pint of peritoneal effusion, the entire bowel was intensely congested, some points almost sphacelous. We lost no time in discovering the obstructing agent which proved to be a tumor developed within the lumen of the gut at about the junction of the ascending and transverse colon, about the size and shape of a spool of thread, which completely filled the lumen of the bowel and had every appearance of malignancy.

His condition was so grave that we brought the bowel over, stitched it in the abdominal incision and immediately opened. He rallied fairly well from the operation and at 3:00 or 4:00 P. M. on the same day the bowels emptied themselves completely, moving in all about one dozen times. From this time, however, he made a good recovery except a troublesome diarrhea which continued for two weeks, at the end of which time he was rapidly gaining appetite.. At the end of a month he was practically well, his bowels moving from the fecal fistula once or twice daily.

On October 3 a second operation was made to close up the fistula either by removing the tumor or making end-to-end approximation or lateral anastomosis. The abdomen was opened but the tumor still having every appearance of malignancy we deemed it best to bring down the transverse colon and make a lateral anastomosis with the ascending colon by means of the Murphy button. One-half of the button was accordingly introduced into the artificial opening and cut down upon the other introduced into the transverse colon and the fistula closed. From this operation he made a very rapid recovery.

However, the fecal course was not side-tracked through our button as we had hoped, from the fact that the peristaltic action of the gut continued to carry the fecal column upwards and by the lateral anastomosis, forcing the fistula

open. The button was removed from the fistula on the sixth day but still the bowels continued to discharge at the original fistula. Occasionally, however, by the use of enemata, he would get some action through the anastomosis, but his condition was much the same.

Being anxious to have the fistula closed, we again operated September 1, 1897, hoping to clip out a spur, thereby enlarging our opening in the anastomosis. But after anesthetizing him we were obliged to abandon the same on account of our opening having entirely granulated up. Rather than incur the risk of having his abdomen open again, he concluded that he would be content with the fecal fistula.

His general health greatly improved, and he became stout and muscular. Almost two years have elapsed since the first operation, his general health remaining perfectly well and the question of malignancy being much doubted. He again presented himself for a fourth operation April 18, 1898. He entered the Protestant Hospital, was prepared, and his abdomen again opened on April 29, 1898. The adhesions which were many and complex, were all broken up and a resection of a sufficient length of colon to remove both fistula and tumor was done, and an end-to-end approximation, by means of the Murphy button, was made.

DISCUSSION

Dr. J. F. Baldwin, Columbus: I do not know of a subject of more practical interest and importance to physicians than obstruction of the bowels. The paper which has just been read ought therefore to meet with a very free discussion. I think we will all agree that when we find obstruction of the bowel, the only thing to do is to operate. The great difficulty is in recognizing that we have a mechanical obstruction which must be removed. We sometimes meet with cases of paralysis of the bowel in which there is apparent obstruction. We also meet with cases of spasmodic contraction of certain portions of the bowel, stimulating absolutely mechanical obstruction, because, of course, the re-

sult of the contraction is the same. Yet on operating in a case of paralysis we find only a greatly distended bowel, or in the case of the spasmodic contraction we find some portion of the bowel, usually the colon, contracted to the size of the finger; but nothing in either case calling for mechanical removal. In the spasmodic form it is possible that with the lapse of time merely and under antispasmodics the obstruction will subside, though it has not been found to subside under an anesthetic.

By listening over the distended abdomen we can sometimes determine the character of the trouble. If we have active peristalsis with much gurgling, but can still get nothing through the bowels, we are generally safe in assuming, even if the case has not advanced to stercoraceous vomiting, that we have a mechanical obstruction to contend with. On the other hand, if there is no peristalsis we will usually find a condition of peritonitis developing, or already developed, which has resulted in paralysis.

One point I wish to make in connection with the last case reported. In our childhood days we have all experienced the pains of colic. A few months ago I was called to see a patient who was dying of obstruction of the bowels. The peristalitic contraction of the bowels, which were at the necropsy found everywhere adherent to the parietes, produced marked depressions and elevations of the abdomen, accompanied with intense colicky pains. But the point to which I wish to allude is that of the force of intestinal peristalsis. In the case referred to by the doctor, I enlarged at one time the artificial anus and introduced my fingers for the purpose of determining the condition of the malignant tumor, which had caused such obstruction as to require the original operation. While my fingers were within the bowel a peristaltic wave came along and I was surprised at the power with which my fingers were grasped. I could compare it to nothing but the power exercised by uterine contractions. I asked the other physicians who were present at the examination to introduce their fingers and wait for the peristaltic wave. They did so, and all spoke of the amazing power exercised by that thin sheet of muscular tissue. We could then understand as never before why it is that patients suffer so much when affected with colic. It was a revelation to all of us.

I hope to see this paper thoroughly discussed, especially

as to diagnosis, for I think we all agree as to the line of treatment.

Dr. Edwin Ricketts, Cincinnati: Like the last speaker, I fully agree as to the importance of this condition so ably discussed by the essayist. I want to say in regard to operative interference of this kind, it is seldom that the mistake of too early operation is made. Unfortunately, we are slack in the early diagnosis of obstruction of the bowel. I think the mistake is often made of waiting for certain symptoms to arise. We should decide when to open the abdomen, on general principles. There is something about a patient suffering from obstruction of the bowel that will impress you as to whether that patient is going to get through or not. It is on this particular line I think we should lay more stress than on hair-splitting diagnoses. The last speaker spoke of obstruction of the bowel due to appendicitis. It is true in many cases, if you will get down to the right inguinal region, you will come on the cause. In a case which came under my observation a tumor was found that could have been removed in less than fifteen minutes' time. The patient had refused operation and death was the result.

Again, I say, we make a mistake more in delaying operation than in operating early. Nine times out of ten, almost ninety-nine times out of a hundred, operators will make very few mistakes if they operate promptly.

Dr. R. B. Hall, Cincinnati: I want first to congratulate the essayist upon his very clear and precise paper. I believe it will do good. It will encourage the general practician to advise operation and encourage the men who operate.

I wish to speak more especially in reference to the difficulties of diagnosis in intestinal obstruction. The operation is such a grave one, no man is willing to assume the responsibility until he is convinced nothing other than operation will relieve the patient. There comes the other danger. These patients change in an hour from a not dangerous condition to a dying one, and the opportunity for a favorable termination to operation has passed by. If we can outline the tumor and say here is the trouble, then we have no hesitation in saying there should be immediate operation. If urged, the family seldom object. But if the physician has to say I do not know where the trouble is, perhaps we cannot

relieve this man if we do open his abdomen, consent is not so readilly obtained. When a diagnosis of organic obstruction is made, no one will hesitate to advise and urge operation. I can realize the difficulty in making a diagnosis. I have been called in consultation to see patients who have been ill for several days. The doctor believed he would be able to overcome the obstruction in a few hours, and a few hours more. When I was called the patient was in a dangerous condition. I wish we could have some discussion on this point. When we know nothing but an operation will relieve a case, we are all agreed.

Dr. F. F. Lawrence, Columbus: Just a word in reference to one point in the diagnosis of intestinal obstruction. My friend, Dr. Baldwin, has spoken of two forms: paralysis of the intestinal walls and mechanical obstruction. Paralysis is preceded by evidence of peritonitis and should not be confused with mechanical obstruction. Another thing of value—the distension in mechanical obstruction comes on gradually and is symmetric, but in acute obstruction it will first be in the line of obstruction. The symmetric or general distension will follow later. In percussing you will come to a sudden stop at a point where tympanites is arrested; the percussion-note becomes dull and flat. This is of more than ordinary value in the differential diagnosis. It does not occur in the paralytic form or any form except that due to mechanical obstruction from a growth or something of that kind. As for operation, it seems it should be done here if any place, if there be a certainty as to cause, and even in those cases where there is a question of intestinal obstruction. It is true there have been cases reported where a portion of the bowel sloughed off, union took place, and the patient recovered. These cases are so rare it only emphasizes the fact that all die without operation. It seems, in the absence of peritonitis, if we have the slightest doubt whether it is due to acute obstruction from intussusception, or is mechanical, or is due to old adhesions, causing binding of the bowel, operation should be done immediately.

Dr. E. Pearce, Steubenville: I wish to say a word about the difficulty of diagnosis in mechanical obstruction. In the case of strangulated hernia, where there is protrusion of intestine or omentum through the inguinal or femoral ring,

it is not very difficult to make a diagnosis of strangulation and obstruction, so very few mistakes are likely to be made. Where the diagnosis is almost certain, it is clear operation should be done soon. But where you have obstruction and have simply symptoms of intestinal stoppage, the obstruction is somewhere within the abdominal cavity, a new question presents itself, and much more difficult to decide, as there is no tumor to locate it. I saw a case a few years ago with a very competent gentleman in attendance. He informed me he had taken the same person through a similar attack before. The patient, a young man, had been attacked with severe symptoms of intestinal obstruction. It went on for several days. There was some little liquid discharge occasionally from the bowel, so there was not complete obstruction. After a few days, quite a tumor formed just in the right ileocecal valve. The symptoms continued. I supposed the trouble was about the ileocecal valve, that the obstruction was there. We went prepared to aspirate. There was no doubt about there being a tumor in region of appendix, larger than a goose-egg, and well defined. After getting everything ready to aspirate, I laid my hand on the ileocecal region and remarked that the tumor was gone. No aspiration was done. He had been taking calomel and laxatives. Diarrhea set in and continued for a number of days, but he gradually recovered. Not very long after that he was in Chicago visiting a sister and was taken violently ill with a similar attack, evidently some mechanical obstruction of the bowel. This I learned from the sister. A physician was called and the history given. He made a diagnosis of some trouble of the ileocecal valve and appendix, requiring operation, which was the one thing that would save his life. He was operated upon and the appendix was removed, given to him, and shown to me preserved in alcohol. He returned home and had another attack just as before. He reported to the surgeon who had operated upon him at Chicago that it was similar. The surgeon said it was not; the other was appendicitis and he had removed the appendix. He insisted it was gall-stones and could not be appendicitis. The sister became fully impressed with that idea and thought perhaps I was rather stupid not to take that view. I could not fall into the opinion that it was gall-stones. The patient died. A postmortem examination was made. The appendix was absent, the ileocecal valve and the large intestine

were perfect. There was nothing wrong with the gall-bladder, but seven or eight inches of the jejunum had contracted to the size of a lead-pencil, and had been the place of partial obstruction, not complete obstruction, which during life had been diagnosed as appendicitis, for which he had been operated on in Chicago.

Dr. A. F. House, Cleveland: I heartily endorse the sentiments voiced by the essayist. While it is true it is not always easy to make an early diagnosis, I fully believe after the diagnosis is made there is nothing but the knife will do any good. I do not believe all Dr. Lawrence said, that in a case where the obstruction is due to inflammatory conditions we should not use the knife, but rely on other means. I believe we should use the knife just as in other forms. I think perhaps streptococcic serum and the knife are the only means we have. I do not know that it is necessary to find the point of obstruction before operating. I believe after the diagnosis is made that obstruction exists, we should make an incision.

Dr. F. Warner, Columbus: I am quite willing to agree with what Dr. House says. When the question is once thoroughly established there is nothing promises relief except the knife. I do not think any of us will take issue with that. Obstruction existing, operation should be performed. But it does not do to be too sure obstruction actually exists, simply because we get no movement of the bowels. I saw that illustrated once. There had been no movement of the bowels for a week. Everything had been tried, medical means and the long rectal tube. The abdomen was flat, and it was easy to make out no obstruction. The patient died. No obstruction was found at the postmortem, neither was there found any reason for the lack of movement of the bowels or for the death. Another line of consideration: When you find it is impossible to secure a movement of the bowels, treat it as if it were obstruction. It was forcibly brought to mind a few weeks ago in a case in which I had tried to secure a movement of the bowels. There was vomiting, and some mucous discharge from the rectum. Operation was proposed but refused, because we could not say what was the cause of obstruction. It was feared it was malignant. They did not want life prolonged to a lingering, fatal suffering. The pa-

tient died. Obstruction had taken place in the small intestine as the result of an enormous gall-stone. It had distended the intestine and pushed out the lax walls, producing a volvulus. Operation would at least have given the patient the benefit of all the chance there was. Had the patient recovered from the operation he would have lived independently of any trouble so far as that is concerned. Still another case in which there was an enlargement. It was relieved by persistent dosing with calomel. It was concluded it was simply a fecal accumulation. If you try mild cathartics, such as calomel, and work along that line and you do not secure a movement of the bowels, it is safer to make an exploration even if you do occasionally open the abdomen when there is no cause found to exist for it.

IRRIGATION WITH SALT-SOLUTION AND OTHER FLUIDS IN SURGICAL PRACTICE

BY HUNTER ROBB, M. D., CLEVELAND

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There exists a great divergence of opinion among surgeons as to the advisability of employing irrigation after abdominal section. While some prefer to irrigate after every operation as a routine procedure, the majority, perhaps, deem it necessary to do so only in those cases in which bloody or purulent fluid has escaped into the abdominal cavity after the removal of a mass or in those cases in which considerable oozing from the separation of dense adhesions has taken place. It has been urged with some justice that where the escaped material is of a septic or of a malignant character, attempts to remove it by irrigation would in all probability spread it still further among the coils of the intestines and into other parts, especially in the upper portion of the abdominal cavity, whence it would be quite impossible to remove it by sponging. With this objection, which certainly demands consideration, I shall deal briefly

a little later. Fortunately in many cases in which pus has been present the escaping fluid contains no virulent organisms, so that irrigation in such cases could hardly do any harm.

The materials used for the purpose of irrigation are plain hot water, sterile salt-solution and a variety of antiseptic fluids. In selecting such a fluid for irrigating the abdominal cavity we naturally look for one that promises the best possible results with a minimum possible amount of harm. Solutions containing germicidal drugs are open to the objection that they can never be of sufficient strength to destroy the septic material without producing local lesions or even general toxic effects from the absorption into the system of the chemical irritants which they contain. Experience has shown that the use of solutions of bichlorid of mercury or of carbolic acid for irrigation of the peritoneal cavity must now be unhestitatingly condemned, not only on account of the local necrotic effects which are produced, but also because of the more or less grave symptoms of general intoxication which have been time and again observed. The experiments which have been made with dilute solutions of sublimate poured into the abdominal cavity of dogs are too well known to need any description here. Even in human beings necropsies have shown that patients have died with intestinal ulceration and peritonitis, or with lesions of the heart and kidneys of which there was no evidence before the operation.

Of the numerous milder antiseptic solutions, such as one-half to two percent solutions of boric acid, Thiersch's solution of salicylic acid and the like, it may be said that they possess sufficient germicidal or inhibiting influence to justify their use.

Even plain hot water is said with reason to have a definite deleterious effect upon the tissues. It is a fact well known to microscopists that when fresh animal tissues are examined in plain water the cells are found to be seriously

altered, and as has been shown by repeated experiments, the red and white blood-corpuscles are injured or completely broken down by its action.

In employing irrigation after abdominal operations we aim not only at cleansing the peritoneal cavity, but also at producing such a stimulus that the effects of shock from a severe and long operation may as far as possible be minimized. In normal salt-solution we have an agent which offers these advantages and which thus far has never been shown to have any deleterious influence upon the tissues with which it is brought in contact. The solution should be made to correspond in specific gravity very closely with the normal serum of the blood. Hence the term "normal" or "physiologic" salt-solution. It is prepared by dissolving 6 grams (90 grains) of chemically pure sodium chlorid in each liter (33½ ounces) of distilled water. The solution is then filtered into a clean flask which may hold about 3 liters, and which is then stoppered with a plug of nonabsorbent cotton. In order to prevent the deposition of dust on the rim of the flask the cotton plug is securely wrapped around with a gauze bandage. After being heated over a Bunsen flame until it boils, the solution is immediately transferred to an Arnold steam sterilizer already heated to 100° C. and allowed to remain there half an hour. The process is repeated on the two following days to insure thorough sterilization. It can be made up in quantities of a dozen flasks or more and kept until needed. When required for use, two flasks are taken, one containing a cold and the other a hot solution. The contents of these are mixed in a sterilized glass graduate, to which a thermometer is attached, and which holds from 500 to 1000 cc. The gauze and plug having been removed with due precautions, the cold salt-solution is first poured into the jar and then enough of the hot solution is added until the thermometer shows a temperature of from 43° C. (110° F.) to 48° C. (118° F.). The thermometer affords the only reliable means of testing the

temperature of the water. The hand of the assistant or nurse supplies only a loose determination and, what is more important still, is liable to contaminate the hitherto sterile solution. This is a detail of importance and the careful observance of it should be insisted upon. The solution is either poured into the abdominal cavity directly from the glass graduate, or it can be siphoned through a glass or hard-rubber nozzle attached to a piece of tubing. Sometimes where more force is required a new Davidson syringe, previously sterilized in boiling soda-solution, with a glass nozzle attached, may be employed. The Davidson syringe, suitable for this purpose, can be bought without the usual attachments for the irrigating end and in this way the cost can be materially diminished. The glass nozzle can be readily attached to the end of the tube, and its lumen, being so much larger than that of the ordinary nozzles which come with these syringes, will permit of a much freer flow through it, and besides a glass nozzle can be more easily sterilized.

In plastic operations, irrigation is sometimes very necessary, and in addition to other advantages afforded by it the necessity of sponging is done away with. A constant stream can be employed and be so regulated as to keep the field of operation free from the blood that would otherwise obscure it and hamper the operator. Here, again, salt-solution is superior to all other fluids. The solution is contained in a sterile glass jar fitted with a piece of rubber tubing which is provided with a hard-rubber stop-cock, as devised by Edelbohls, by which the current is controlled. Instead of a glass jar, a fountain-syringe may be employed. This can be easily rendered sterile by being boiled in soda-solution or by being first soaked in a 1-40 solution of carbolic acid and then rinsed out with plain sterile water.

To meet the objection raised against irrigation that it might disperse septic or malignant particles of material among the coils of the intestines, especially in the upper part

of the abdominal cavity, it is safer in every case in which the presence of such infective material is suspected to first swab out the abdominal cavity with sterile gauze sponges and afterwards employ irrigation.

I have used salt-solution for irrigating the abdominal cavity for the past eight years; and for the past three years I have left in the abdominal cavity from 300 cc. to several liters of salt-solution at a temperature of 110° F. (43° C.) after every abdominal operation when not employing drainage. From observation of my cases I am convinced that this procedure undoubtedly diminishes the shock which generally follows a serious abdominal operation and I also believe that it often diminshes the thirst of which patients so frequently complain after such operations. In those cases in which pus has escaped into the abdominal cavity I employ it according to the method recommended by Dr. John G. Clark, and in many cases in which large quantities of pus had escaped into the abdominal cavity, after the latter had been thoroughly cleansed, I have poured into the abdomen from 500 to 1000 cc. of the salt-solution and placed the patient in the position suggested by Dr. Clark in the treatment of this class of cases.

It has also been my practice for the past three years to use irrigations with salt-solution during plastic operations. Since adopting this procedure I have seldom met with any macroscopic pus formation after plastic work and I am led to believe that the irrigation with salt-solution has in some way contributed to this result. In order to save time I am in the habit of sterilizing a sufficient quantity of salt in a test-tube in the autoclave, or Arnold steam sterilizer; I then place the necessary quantity in a sterile fountain-syringe or glass vessel and add the requisite amount of sterilized water.

The only objection to using this fluid during plastic operations would seem to be that it rather prevents the clotting of blood from the cut vessels. I do not think,

however, that this disadvantage is of any great importance as with a very little experience the operator will soon recognize what vessels it is necessary to ligate, and how far pressure will suffice.

Normal salt-solution is easily made. It is cheap and it seems to me that its value as an irrigating fluid has up to this time been somewhat underestimated, and that its more general employment in surgical and gynecologic operations is indicated. I certainly cannot recall to mind an instance in which its employment has done any harm in my hands. On the other hand I cannot say this of other solutions which have been in vogue at various times and I have come to the conclusion that salt-solution possesses certain advantages of its own while being without the disadvantages belonging to other fluids used for irrigation.

DISCUSSION

Dr. H. J. Herrick, Cleveland: I would like to take this time to express my gratification at the sensible modified views on antisepsis. This paper is suggestive and holds up a feeling of regret and remorse at the experiences of the profession for the past ten years. He demonstrates upon dogs, the effect of the solutions that have been used by A, B and C. We are through with that. We are coming back to our senses and using nature's way. All the excretions are saline. Blood is saline. Everything is saline for vital metabolism. We are coming back to nature. I have no objection to salt-solution. I do object to the use of the astringent and antiseptic solutions of the most noxious agents known to antidote, imaginary or feared toxemia. I commend Dr. Robb's paper.

Dr. C. A. L. Reed, Cincinnati: I never listen to anything from Dr. Robb but I feel instructed and entertained. It is a valuable and suggestive paper. I believe it represents a class of contributions of which there ought to be more, namely, contributions that deal with the less dramatic features of our work and give some specific attention to those details upon the success of which our success so largely depends. Viewing the paper from the standpoint of my personal experience, I claim the right to speak both pro and con. I have been an "irrigationist" but now I am a "dry"

operator. I mean in the surgical sense strictly. I have had occasion, and I believe upon pretty good grounds and with some force, to see that promiscuous irrigation may serve as a disseminator of preexisting poisons. The author says pus in the pelvis is generally innocuous. If it is innocuous why should we irrigate to remove it? It brings us face to face with the question, why this should be essential. I believe my last two years' work will compare favorably, and perhaps more than favorably, with my previous work. It was done before the general use of the normal salt-solution. I have never employed bichlorid or other corrosive solution. I have seen the disastrous consequences of this treatment in certain cases. Dr. Robb has demonstrated that the extreme continuation of bichlorid solution is not a good thing for dogs. I am thoroughly convinced that bichlorid solution is far from being a salutary measure in the human subject. I believe the most extensive operation I ever did was the separation of adhesions as the result of the use of bichlorid solution. It seemed there was no part of the intestinal tract in which I did not break up approximal adhesions. But if we are to irrigate, I believe by all means normal salt-solution should be employed. In case of hemorrhage, normal salt-solution is an efficient cleanser, and, if any is left in, it is absorbed with facility and helps to supply what has been lost, assuages thirst and diminishes shock.

I wish to commend the very painstaking method employed by Dr. Robb in the prepartion of this solution for the purpose of rendering it a truly aseptic solution. Many of these details may be looked upon by us as essentially trivial. Followed in any disconnected way, they would seem to be so, but taken in their entirety they represent a system, the efficiency of which cannot be gainsaid.

Again I wish to congratulate the essayist upon this very valuable paper.

Dr. C. F.Hoover, Cleveland: I wish to make a few remarks from the standpoint of the medical man who sometimes has occasion to see the rapidity with which fluid can be absorbed from the abdominal cavity. I had a case under observation for two years, during the last six months of which period there had been fluid in the abdominal cavity. The ascites recurred with increasing rapidity, so that the patient had to be tapped at intervals of three or four days, and each time from four to six and sometimes eight quarts

of serum were removed. Suddenly, one evening, he had very copious emesis and passed free blood from the anus as well. The astonishing thing was, that the man developed a full pulse of high tension, really a pulse of large volume and long duration. The abdomen was retracted. At the necropsy there was not a drop of free fluid in the abdominal cavity. It is safe to say he had absorbed not less than six quarts of his own serum during the twenty-four hours. The man died from the fact that the only circulating medium he had was serum and not blood.

Dr. Robb said, in conclusion: I wish to thank the gentlemen who have taken part in the discussion of my paper, and especially do I extend my thanks to Dr. Reed for his flattering criticisms. The question of drainage in abdominal surgery is a very wide one, and I have not attempted to deal with the subject as a whole. I believe that where there has been an accumulation of pus or any other inflammatory material in the pelvis, even though there may be no living bacteria present, the toxins may still be there, so that we have a focus, which may produce far-reaching evil and which we should remove as far as possible, if we can do so without risk. In order to effect this, it is my custom to first remove as much of the deleterious matter as possible by mopping out the cavity with sterilized gauze-sponges, after which the pelvis is irrigated with large quantities of sterilized normal salt-solution at 112° F. Even when little or no inflammatory material is found to be present, the procedure has decided advantages, and by leaving the salt-solution in the abdomen we are often able to diminish the thirst and shock from which the patient sometimes suffers. My personal observations certainly have satisfied me that we can in this way do no harm; and in some cases, I am sure, the life of the patient may be saved, and in others the convalescence may be materially hastened.

The question of the rapidity with which fluids can be absorbed from the peritoneal cavity, as suggested by Dr. Hoover, has been demonstrated in the experimental work carried out by Wegner, in which he showed that the peritoneum has an enormous absorbing function, and that it could take up in an hour an amount of fluid equal to from 3 to 8 percent of the entire body-weight of the animal. The absorption of the fluid through the spaces in the endothelium

in the diaphragm is assisted by placing the patient in the Trendelenburg position, and as has been shown by the work of Muscatello, if fluid is left in the abdomen, and any foreign body which may be present at the same time, can much more easily be carried through the spaces in the diaphragm by the leucocytes, after having been broken into finer particles by the fluid.

OSTEOSARCOMATA OF THE FEMUR

BY E. W. WALKER, M. D., CINCINNATI

Sarcomata affecting bone are anatomically divided into two kinds, those affecting periosteum and those affecting the medullary cavity. The medullary growths are generally giant-celled. Sarcomata of the periosteum are, as a rule, spindle-or round-celled tumors. The diagnosis between the giant-cell tumors and the other varieties is very important on account of the very much less malignant type of the giant-celled growths. Locally they are as malignant as the other tumors, but not constitutionally. The osteosarcomata follow trauma more frequently than any other form of malignant tumors. Trauma preceded the tumor in probably one-fourth the number of cases.

The number of cases of osteosarcoma of the thigh I have to report is 13. Of these 13 cases 11 were operated on, the other two refusing to have anything done. Of the 11 cases operated on, seven were of the giant-cell variety of medullary tumor. The other four cases were periosteal and of the spindle-and round-celled variety. In one of these periosteal cases, the case left the city a short time after operation and the positive result is not known. In two cases there was return, and, although the immediate result of operation was favorable, the cases died eventually from metastatic return in the internal organs. The fourth case was one in which the patient withstood so many trials that it is worthy of report.

The patient, a young lady about 22 years of age, presented herself with a tumor on the anterior external aspect of the thigh about two inches above the knee-joint. The tumor was about the size of the closed fist. It was somewhat painful and apparently attached to the bone. There was some cachexia, although it was not marked. The patient would not agree to amputation unless the bone was badly involved. The tumor was enucleated readily, and, although there was an indentation in the bone from pressure, the periosteum was healthy. Supplying the tumor was an artery about one-half the size of the radial, which had to be ligated very near the main vessel. I said to my assistant at the time that I feared secondary hemorrhage.

On the eighth day after operation there was a severe hemorrhage, tearing open the lips of the wound. The clot was turned out and the hemorrhage stopped. Two days afterwards there was another hemorrhage, which was so severe that it necessitated ligation of the femoral above and below the bleeding vessel.

The foot immediately blanched, as collateral circulation was not established. On the twentieth day after first operation the thigh was amputated about the upper third. The patient made an excellent recovery, and now, about two years since the operation, has had no return.

This patient had to fight the shock of first operation, two severe hemorrhages, gangrene, shock of amputation, and finally won the fight against these terrific odds.

Of the seven cases of giant-cell sarcoma of the femur, six affected the lower end and one the upper end of the femur, in six of the seven cases amputation was done at the hip-joint. Five of the cases survived the operation. Three of them had no return inside of one year. One of these three, no return in three years. The other two cases, one died six months after the operation from secondary trouble in the lungs. The other case died from shock on the third day after the operation. In the latter case the man had been

treated for sciatica for a long time. He had contracted the morphin habit. When first operated on he refused absolutely to have an amputation performed. The tumor was cut down on and the wall cut and chiseled away as well as possible. The operation relieved the pain greatly. After the return of the growth in about four months, he agreed to an amputation. The shock was too great and he died on the third day after the operation.

The two cases refusing operation ran the usual course, dying, as it were, by inches. In both of these cases Coley's combined toxin of *bacillus erysipelatosus* and *bacillus prodigiosus* were used with no benefit whatever. The same method I have employed in quite a number of inoperable cases of sarcoma with little or no benefit.

In the six hip-joint amputations Wyeth's pins were used in four cases with excellent results. In the other two cases the femoral was ligated before the amputation was made. This was also a satisfactory method, the hemorrhage being slight.

In three of the cases, the last ones operated on, the diagnosis of medullary, probably giant-celled sarcoma, was readily made by the Roentgen ray, the skiagraph showing very plainly the involvement of the bone. The X-ray ought to be used in all cases to aid diagnosis and prognosis. In all cases of medullary growth reported the pain was very great.

In all cases there was some fever in the evening. The hectic seemed to me to be present in sarcoma of bone in almost all cases, and probably has much to do with the associated cachexia.

From this brief report of 13 cases, I think the following conclusions can be drawn:

1. Always operate in these cases, other things being equal.

2. As a rule, operate as far as possible from the growth.

3. Use Roentgen ray to aid in diagnosis.

4. Giant-celled tumors are much less malignant than round or spindle-celled growths.

5. In sarcomata the use of the erysipelatous toxin is not satisfactory.

6. Great pain accompanied by slight hectic is almost always present in osteosarcomata.

SUCCESSFUL REMOVAL OF THE CECUM FOR MALIGNANT DISEASE

BY JOHN CHADWICK OLIVER, M. D., CINCINNATI

Surgeon to the Cincinnati, Christ's and Presbyterian Hospitals, Professor of Descriptive Anatomy, Miami Medical College

Mr. L. H. B., aged 56, clergyman, married. Until August, 1897, he had always been in good health. At this time, after eating some green corn, he was seized with pain in the abdomen, vomiting and other symptoms of intestinal obstruction. This attack soon passed away but was followed by another in a few weeks. The second attack also followed the ingestion of corn.

Subsequently, the pain became localized in the right iliac region and a lump could be made out there. The patient says that he would be painfully conscious of the stoppage of gas at that point, but that, in a few minutes, the gas would pass the apparent obstruction and he would be relieved.

I first saw him January 21, 1898, at Christ's Hospital. He was emaciated, having lost forty pounds since the preceding August; his color was bad (brownish-yellow), and his strength was much diminished.

Physical examination revealed a hard, freely movable mass in the right iliac region. By manipulation it could be moved in any direction without causing pain to the patient. It seemed to be about the size of a hen's egg. While examining the patient a curious phenomenon occurred; the

tumor seemed to enlarge quickly and the hard lump mentioned above became obscured. The enlargement became so great as to visibly raise the abdomen on the right side; this enlargement was accompanied by considerable pain. While examining the enlargement it suddenly disappeared with an audible, high-pitched sound such as would be produced by forcing imprisoned air through a small opening. The subsidence of the tumor was followed by very evident relief to the patient. Rectal examination was negative, as was also an examination of the urine.

Because of the fact that the hard mass was so freely movable, I hesitated as to diagnosis between carcinoma of the cecum and an enterolith. The clinical picture was certainly that of carcinoma, but the history of having swallowed a plum-seed during the previous year and the extreme mobility of the mass led me to consider the possibility of an enterolith.

His daughter, a physician, was told the facts in the case, and a laparotomy was advised. The patient's consent was easily obtained, as he was clamorous for an operation.

On January 26, 1898, an incision was made in the right *linea semilunaris*. The mass was lifted up out of the abdominal cavity and the fact of its being a carcinoma plainly established. The small intestine above the cecum was very much distended while the large intestine was collapsed. The entire cecum was a mass of carcinoma, the vermiform appendix not being involved. Its lumen was reduced to about the size of a lead pencil. This condition explained the mechanism of the curious phenomenon above referred to—the intestinal gas would accumulate in the small bowel just above the cecum and it would become distended until the pressure became great enough to force it through the cecum into the large intestine, its passage through this constricted portion giving rise to the high-pitched sound. The cecum was not adherent to the surrounding parts. The mesenteric glands gave plain evidence of infection, and this was widespread.

The choice of operation was between the establishment of an artificial anus in the lower part of the ileum, and a resection of the cecum with an anastomosis of the divided ends. The latter seemed the wiser course to pursue. In order to have the ends of about equal diameter, the small intestine was ligated about four inches above the cecum and the large intestine about two inches below it. After tying off the vessels, a running suture was inserted into each end of the bowel, the two halves of a large Murphy-button were inserted and then pressed together. A few Lembert sutures were inserted along the line of union, the bowel was dropped back into the abdominal cavity, and the parietal wound was tightly closed with silk-worm gut sutures.

For the first three or four days following the operation he was allowed nothing but buttermilk and beef-tea. Raw oysters, cream and cornmeal gruel were gradually added to his dietary. The highest temperature following the operation was 99.4°, and he rapidly convalesced. The button passed on the thirteenth day and he was allowed to assume the sitting position on the fourteenth day.

He received one dose of morphin (¼ gr.) hypodermically, the night of the day of operation. His bowels were moved daily by simple enemata.

It seems to me that much of the safety in this operation lay in the fact that we were able to bring the portion of bowel operated upon outside the abdomen and thus make the operation practically an extraperitoneal one.

February 8, 1898. The patient's appearance is very much improved; his complexion is better and he seems actually to have gained in weight. He was allowed ordinary diet today.

So far as I know, this is the first case in Cincinnati in which the cecum has been removed.

The following pathologic report is made by Dr. H. J. Whitacre, to whom I sent the specimen for microscopic examination. "The hardened specimen received by me

was the cecal portion of the intestine, including 2½ cm. of normal large intestine, 5 cm. of much dilated yet apparently normal small intestine, and the vermiform appendix 9 cm. in length. In the region of the ileocecal valve there is a distinct ovoid tumor 6½ cm. long and 3 cm. in its greatest diameter. On the mesenteric border of the intestine there are three enlarged mesenteric glands.

"A specimen for microscopic examination was taken from the center of the tumor mass extending from the surface into the cavity of the intestine and representing a thickness of 1 cm. Sections were made to include this thickness. In the mucosa, the perpendicular glands are well preserved in their outline, but the cells are in a condition of colloid degeneration. The submucosa and muscularis seem to be replaced by a dense structure of fibrous tissue and smooth muscle-cells. Irregularly distributed through this structure are found masses, columns, rows or individual cells of the epithelial type and in no connection with the surrounding tissue. Certain areas show distinct unstained globules of colloid material, the cell-body or entire alveolus being replaced by the colloid material. The presence of the colloid within the cell-body makes most of the cells look unusually large. The structure is that of a colloid carcinoma of the scirrhus type. The peritoneal coat is greatly thickened but apparently not invaded by the tumor cells. The mesenteric glands show no changes that are definite."

The report is of interest because of the rarity of the affection under consideration and also because of the very satisfactory course of the patient subsequent to operation.

The last report, a few days since, is that he now weighs more than ever before. The cachectic appearance has disappeared, and he says: "No one would, from my looks, think or imagine that I had ever been sick, cut open or passed a button. I have no pain, experience no inconvenience, can handle myself and move about as usual." His gain in weight has been phenomenal. On January 26, the day of

operation, his weight was about 114 pounds. On the 17th of February, 123 pounds; February 21, 127½ pounds; February 26, 139 pounds; March 3, 147 pounds; March 7, 154 pounds; March 12, 163 pounds, and March 25, 167 pounds.

DISCUSSION

Dr. J. B. May, New Holland: I would like to ask if it is customary to place Lembert sutures, or why they were placed in this locality?

Dr. Oliver: In reply to the question, I would say Leambert sutures were introduced because when the button was put in there were one or two places where the coat of the bowels was not accurately together. This was used simply to reinforce.

THE INCISION LESS THAN ONE AND A HALF INCHES LONG IN APPENDICITIS

BY N. STONE SCOTT, A. M., M. D., CLEVELAND

Consulting Surgeon to the City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Out-Patient Department, Cleveland General Hospital, etc.

Art is long. My subject is short. Since today's program is "art full," I shall endeavor to deal with the subject in a becoming manner.

In planning an incision which is to extend through the normal abdominal wall, that is best which meets most fully the following requirements: First, an incision that will permit of all necessary manipulation, both for examination and treatment. Second, one leaving the abdominal wall as nearly normal as possible. Third, for cosmetic effect, one which will show the least scar. Of the methods which accomplish these results the "gridiron" incision is generally admitted to be the best; it is equally applicable to acute and chronic cases.

It is the purpose of this paper to discuss the length of

incision which is most advantageous. In favorable chronic cases this need not be over half an inch; while in favorable acute cases an incision of one inch will furnish the room required.

The technic in chronic cases is somewhat as follows: The location of the appendix should be made out as nearly as possible. By careful palpation it will usually be detected by the sense of touch; but if, on account of rigid muscle or for other cause, it cannot be felt, the hypersensitiveness of the appendix will often enable the patient to indicate its exact location. The incision should be made directly over the appendix if it can be located; if it cannot be located, let the incision be on a line with the anterior superior spine at the external border of the rectus. Upon opening the abdomen, should the appendix be found at some distance from the incision, firm traction on the abdominal wall, by means of one retractor, will carry abdominal wall and incision to the place for intraperitoneal manipulations. The opening through the skin and superficial fascia must be long enough to give free access to parts beneath. The length of this is not objectionable except from a cosmetic standpoint; as the efficiency of the scar will depend upon the proper coaptation of the muscle and fascia. For this reason, therefore, when speaking of the incision in this paper, the separation of the muscle and deep fascia is intended. The fibers of the external oblique are separated downward and inward a distance of half an inch; two small retractors hold them apart and bring into prominence the transversalis; the fibers of this are separated in the same manner and the peritoneum taken up and opened; the finger is then introduced through the opening and the retractors withdrawn. A more careful examination can thus be made than is possible through the abdominal wall, while the dangers of injury are nil. This incision of half an inch in length gives plenty of room through which to pass the index finger and make such careful examination. If this case be a chronic relapsing appen-

dicitis with hyperplasia of tissue, the half-inch is large enough also for treatment, even when adhesions are quite extreme, so long as they can be separated by one finger. Now the appendix should be freed from all adhesions, hooked up with the finger, and brought to the anterior abdominal wall. It can then be either forced out by the side of the finger, or a small retractor can be placed at the side of the finger, so that, as the assistant draws the incision aside enough to bring into prominence the appendix, it is grasped with a pair of forceps. The finger is then withdrawn from the abdomen, and the appendix and head of the colon delivered through the incision. During subsequent manipulations the abdominal wall tightly clamps the head of the colon, preventing all possibility of infection of the general abdominal cavity. When the head of the colon is replaced, the parts fall back into their natural position, and the amount of incision is so slight that one stitch will thoroughly close the abdominal cavity, or rather will retain the parts in position, the abdominal cavity being practically closed without any stitch.

The technic in acute cases with abscess is the same as in chronic cases. We have, however, one possibility to be borne in mind and carefully guarded against; that is, infection of the general abdominal cavity. It is possible, while making the intraabdominal examination, to arrive at a conclusion as to the condition present with the use of less pressure than is necessary in the preliminary examination; with an incision an inch long, which is dilated to a much larger extent, the lips of the wound are held apart by two retractors, so that the abscess cavity can be seen through the incision. One assistant should give his entire attention to keeping the lips of the wound apart; not even for a moment, after the abscess has been opened, should the tension on the retractors be released until the drainage-tube has been inserted. Should the assistant be negligent, allowing the lips of the wound to come together, there is a probability of infecting the general abdominal cavity.

The gridiron incision is applicable even in acute gangrenous appendicitis where the appendix is just ready to rupture, or where the circumscribing adhesions are slight. Here the history of the case should forewarn. "Forewarned is forearmed." In this latter class of cases the separation of fibers for a distance of at least two inches will be required to give sufficient room so that the appendix may be delivered without putting traction upon it. This original two inches does not limit the size of the opening through which one is permitted to operate. After retractors are placed on the walls and a considerable amount of force is applied to them, the space will be greatly increased in size, the tissues of the abdominal walls stretching for operative purposes as does the vagina before the oncoming head.

Convalescence with the short incisions is remarkably rapid. Acute suppurative cases, instead of taking from six to eight weeks for recovery, will be up easily in half that time; acute cases operated on before rupture occurs, in which the abdomen can be closed without drainage, will usually be up in ten days; while chronic relapsing appendicitis operated on between the attacks will often be up in from three to six days. Hernia is extremely rare. I have never seen it following the gridiron incision.

While this method of procedure requires special aptitude, it has decided advantages, and so far as I am aware has no great disadvantage except that it requires the work to be done by the sense of touch rather than by the sense of sight. My experience leads me to the belief, however, that the sense of touch in the majority of cases is the sense that must be relied upon. All will admit that the incision should be large enough to accomplish the result. The man, with a large finger and a lack of delicate touch will, of course, require a much larger incision than one with a small finger well trained.

The only possible objection to the incision less than one and a half inches is the delicacy of touch required and the

substitution largely of touch for sight. Given the necessary tactile education, however, the advantages are:

First—The absence of liability to hernia.

Second—Reduction of the period of convalescence.

Third—Cosmetic effect.

In closing, I have selected at random the following illustrative cases:

Case I.—Chronic relapsing appendicitis operated on during the interval. C. W., aged 36. Operation, April, 1897. Appendix reduced to fibrous cord; half-inch incision. Patient up in a week.

Case II.—Chronic relapsing appendicitis with hyperplasia. Rev. C., aged 35. Operation, January 11, 1897. Incision three-quarters of an inch. On opening the abdomen extensive adhesions were found, which were freed by the index finger only after careful work. Patient was away from the pulpit two Sundays.

Case III.—Chronic appendicitis without adhesions. Kindness of Dr. Taft. Operation, February 22, 1898, during the interval. Incision half an inch. Abdomen closed with one stitch. Friday, the morning of the third day, being bright and sunny, I arranged to take the patient down to the Cleveland Medical Society, as he not only sat up with perfect comfort, but walked across the floor and back. During the afternoon a snow-storm came up, so that it did not seem prudent to take the patient out. From this time on he sat up and had an uninterrupted recovery.

Case IV.—Chronic relapsing appendicitis, operated on just before an attack. Mr. D., orderly. Operation, March 23, 1898. Incision three-quarters of an inch. Abdomen closed with one deep stitch, skin closed with three superficial stitches. Second day, patient sitting up in bed reading novels. Fifth day, patient gets up without permission and up every day after. Tenth day, patient rides down town on the cars and has his abdomen photographed.

Case V.—Acute appendicitis, operated on early. Al-

bert S., aged 13. Operation, March 11, 1898, eighteen hours after commencement of the attack. Temperature 104° and pulse 120. Appendix intensely congested. Incision one inch. Closed without drainage. On the third day he insisted on jumping out of bed and running around the room, whenever the nurse's back was turned. From this time on he was up every day and made a complete and perfect recovery.

DISCUSSION

Dr. N. P. Davidson, Hilliard: One word: It was too long—the incision.

Dr. F. Warner, Columbus: It is well enough to curtail the length of the incision if it will prevent rupture, but in anything so serious, cosmetic effect should not be considered.

I believe anyone will fail to locate the appendix before operation nine times where they locate it once. If there is an abscess then you may be able to locate it, but if you have merely an acute catarrhal appendicitis, I believe it is very seldom you will be able to locate it. So far as being able to manipulate the appendix with one finger, I question if it is advisable to attempt it. Try to handle an appendix where there is pus, with one finger through so small an incision and nine times out of ten you will rupture it. And how are you going to cleanse the cavity through so small an incision? It is utterly impossible to cleanse the pus from the field. I say with so small an incision you are going to run a great risk. It is extremely important to operate in appendicitis before rupture has taken place. Often you do not begin your operation until it is thoroughly demonstrated you have appendicitis to operate upon. If you rupture, you will produce general infection of the peritoneal cavity. You will get into trouble if you attempt to handle it with so small an incision. The small incision will work in a case in which there is simply catarrhal appendicitis or no appendicitis at all; then you can hook the appendix up with a single finger without fear of rupture.

Dr. J. E. Sylvester, Wellston: The paper we have just listened to is quite plausible. I will grant you an expert in

that line, such as Morris or Deaver or Scott, may do the operation on the plan laid down in the paper, but I am satisfied if the operator in the country with the average surroundings undertakes to do it according to that plan, he will make a bungle of it. I am reminded of a remark made by Professor Senn when I saw him do an operation for appendicitis. It was just after Morris had published his paper on "an inch-and-a-half incision and a week-and-a-half in bed." Senn said he did not intend ever to operate through any inch-and-a-half hole; he wanted plenty of room. I noticed in that particular case he made an incision about five inches long.

Dr. J. F. Baldwin, Columbus: I have listened to the reading of this paper with a great deal of interest, and I have read the paper by Dr. Morris, which has just been referred to. I operate upon cases of appendicitis with fair frequency, and while I have occasionally found it possible to remove an appendix with few or no adhesions through an inch-and-a-half incision, the cases we see in Columbus are very seldom of that kind. Only this morning I made an operation for chronic appendicitis, in which I think my incision was not to exceed an inch long. I could just get my finger through; but such a case is rare. A girl just left the hospital today upon whom I operated about ten days ago. Within forty-eight hours from the inception of her attack the region of the abdomen around the appendix was bathed in pus and the appendix was gangrenous and perforated. I did not in that case operate through an inch incision. My incision was two- and-a-half or three inches long. I made it as long as I needed it and no more. If I had needed an incision of ten inches I should not have hesitated to make it. It is not the length of the incision but the requirements of the case that should govern. That little patient went home well today. A month ago I had another case in which I commenced with a short incision. I opened immediately upon an abscess-cavity filled with vile pus. Cleaning this out and not finding the appendix, I broke up adhesions deeper and found another cavity, also containing the vilest of pus. Still not finding the appendix, I separated the adhesions still more widely, when I opened into the pelvis, which was full of pus. This being cleaned out and the adhesions more widely separated, I at last found the rotten appendix and removed it in the usual way. My original incision was altogether too

short for this work, and I had to enlarge it as I went along. That girl recovered promptly and went home a few days ago. It is such cases as these that we are in the habit of getting around Columbus. My own fingers are fortunately long and slender. I have just measured my forefinger and find it at its base two-and-a-half inches around. That must mean an inch-and-a-quarter incision. Fascia is very slightly elastic, but it is easy to split between its fibers. If my forefinger goes through a short incision is necessarily follows that something has given way in order to permit its passage. I have done too many operations to believe that any man can, in a great majority of cases at least, do satisfactory work or safe work through a little bit of a buttonhole incision. I want my incision just as short as will enable me to do the work with rapidity and with a maximum of safety to the patient.

Dr. T. C. Martin, Cleveland: It is conventional for doctors to disagree. I would say, if I may paraphrase the New York *Sun*, "If Scott says it's so, it's so." I have seen this incision and I have seen his patients afterwards. It is demonstrable, as is well known to many of us, that a small incision through a given point in the abdominal wall may be moved over a great region of territory. Because of the mobility of any given point in the abdominal wall a small incision renders the abdominal cavity more accessible than is generally believed. I do not believe the essayist means to convey the impression that all appendicitis patients should be operated on through a half-inch incision. Another point which he suggested should be remembered; that is, the elasticity of the wound. An incision half-an-inch in length, made through the abdominal muscles, because of their elasticity, may be stretched to admit a mass of fingers of two-and-a-half inches or more in diameter.

Dr. R. B. Hall, Cincinnati: I listened to the paper with a very great deal of interest, for it is an interesting subject, not only to men in this line of work, but to every physician. I will grant that the technic outlined by the doctor can be carried out with perfect satisfaction in cases of chronic recurrent appendicitic, operated on in the interval, but I doubt the advisability in acute cases. An incision an inch or less in length, in an acute case, would be bad surgery. It is in these

cases that danger of infection from spilling the pus occurs. When you open the abdomen and open into an abscess, you can evacuate the pus without danger of liberating it into the abdominal cavity, by a short incision. If you make the short incision and open into the peritoneal cavity first and not into the abscess cavity, you court death, for when you liberate the appendix, the pus will be spilled into the peritoneal cavity. If there is anything demonstrated to my satisfaction in surgery, it is that you need a longer incision in this class of cases. You need to see as well as feel what you are doing. If you expect to give your patient the best chance for recovery, it is necessary to wall off the peritoneal cavity with gauze before liberating the pus. This cannot be done through an inch incision, but it can be done through a two-inch incision. Liberate the appendix and the pus can be mopped out without danger of infecting the cavity. The patient will get well. The safe rule is to make the incision long enough so that you are master of the situation. The doctor did not emphasize this, but I have no doubt he operates in this way.

Dr. J. B. May, New Holland: We are not all fortunate enough to be experienced operators, or to be near medical and surgical centers so we can call on experienced operators. I suppose the small incisions are good, but we lose the benefit of the exploration. All incisions are for exploration, that we may be reasonably certain of what is there. I cannot operate through a small incision, but I can do it through an incision long enough that I can get hold of the stump to manage it. I think for the general practician the long incision is the only safe and proper one. It seems that discussions on all topics are for specialists mostly. They are very good to listen to and profit by, but the general practician must be able to fight diseases and do all sorts of operations; to get up in conventions and talk, things he seldom gets a chance to do, and is liable to blunder at all of them.

Dr. L. B. Tuckerman, Cleveland: We are all likely to think everybody else can do what we do; we forget the limitations which are put on men. Some men can do some things other men had better not attempt to do, but if those other men keep clearly in mind the general principles of surgical cleanliness, they can get just about as good results.

Dr. Scott, closing: In regard to the location of the appendix, I do not believe I can, nor do I think anyone can, palpate the normal appendix every time, but I do think the position of the diseased appendix can usually be diagnosed. In a case of chronic appendicitis with hyperplasia of tissue, one can palpate the appendix and roll it under the finger like a hard cord. If the case be one of catarrhal appendicitis the patient can diagnose the position by the hypersensitiveness of the appendix. Most of the discussion today has been off the subject. I do not believe anyone would advocate removing the gangrenous appendix through a very short incision. I said "history should forewarn." The incision should be large enough to allow the appendix to be removed without pulling up on it, but I do not believe in the unnecessary cutting of tissue. The incision, however, should be large enough for the operator to do the work. In regard to the man who needs a ten-inch incision, if he operates he will have to make it, but preferably he ought not to operate.

One of the strong points for the small incision is the absence of liability to hernia. If you have appendicitis with an anomalous position, you need not have necessarily a large incision. Two cases lately operated on, in which I was not able to diagnose the positon of the appendix, illustrate this point. One appendix was down in the pelvic cavity and one up as high as the liver. The incisions were one-and-a-half and two inches long, and both were placed at McBurney's point. In both cases the adhesions were very firm. A retractor on the lower edge of the wound brought the incision down to the one, and a retractor on the upper edge of the other brought it up. A large incision is not necessary for an inspection of the abdomen. The genitourinary specialists look into the bladder through a quarter-inch opening. A five-inch opening is not needed to look into the abdominal cavity.

In regard to keeping out pus from the general abdomen, one must pick his cases for the small incision, place retractors in the abdominal wall and put it on the stretch. That procedure will force the wall down on the intraabdominal structures, and the abscess will present at the bottom of the opening. One assistant should give his entire attention to keeping the incision open until the drainage has been put in, then retractors are withdrawn.

THE TECHNIC OF MINOR COSMETIC SURGERY

BY L. A. YOCUM, M. D., WOOSTER

In dealing with my subject, "The Technic of Minor Cosmetic Surgery," I do not expect to present anything new. I only hope to bring before this body of progressive, practical physicians and surgeons a subject that has been to me one of no little importance—one in which I, at least, have not had the results that we most covet. I am sure we younger men will be much benefited by a brief discussion of the subject by those of you who have had more experience in such cases, so I will start at once with my case.

The patient, a schoolboy of fifteen years, had been playing "hide and go seek" with his companion and had come very forcibly in contact with a tree in the dark. As a result he was knocked heels over head backward and was picked up unconscious, bleeding from a contused gash extending from below the left malar bone up over the nose at the juncture of the cartilage with nasal bones, separating the chondral articulation at the left side and pushing the tip of the nose far out of the median line to the right. The skin and soft parts were cut or bruised through, exposing the periosteum.

The wound was filled from its commencement on the cheek to up over the nose with bits of bark, thorns, clotted blood and sand. The cheek and both eyes had begun to take on that purple, puffy appearance, characteristic of these tissues under such circumstances.

He was given a dash of cold water and a few whiffs of aromatic spirits of ammonia to arouse him to consciousness. While my assistant filled two irrigators, one with bichlorid solution 1/2,000 and the other with boric acid solution, I showed the father how to prevent the boy's eyes from becoming black by applying compresses of absorbent cot-

ton (borated), wrung out of as hot water as the face would stand.

By this time the irrigator containing bichlorid solution was ready and a steady stream from that was turned on my hands for several minutes; following this the boric-acid solution was used and then, in the absence of nascent chlorin, my hands were immersed for a short time in 90% alcohol. Hemostats, forceps, scissors, scalpel, needle-holder, needles and silk were sterilized by steam. Thanks to the hot-water compresses the face had assumed a ruddy glow and lost its puffiness. The assistant had lathered the face and the down of youth quickly disappeared under the keen edge of the razor.

The bichlorid stream was turned on and the face was carefully mopped with a piece of absorbent cotton and all the bits of bark, thorns, sand, clotted blood and shreds of torn tissue were removed. The edges of the lips of the wound were smoothed with scissors and straightened as much as possible so they would unite with the smallest amount of interspace. The bichlorid stream was then changed for the boric-acid solution and all traces of bichlorid were washed out. The periosteum was found to be intact over the separated cartilage. Several little twigs of arteries were found and their bleeding mouths closed by a few twists of the hemostat and oozing ceased. The young man was a little soldier, so I closed the wound without an anesthetic.

Using a small, strong sterilized catgut suture armed with a curved needle I followed a modification of Halsted's method, passing the needle through the skin at the lower angle of the wound, then back and forth through the muscles of the cheek, first one side of the wound, and then the other, and finally coming through the skin at the angle of the nose.

My assistant pressed now firmly with a hand on the cheek on each side of the wound, and I pulled firmly on each

side of the catgut suture and my catgut pulled the deep tissues of the wound together like a purse-string. Next my silk coapting suture was passed through the opposite side of the lip of the wound and the tail-end tied to the deep suture which was held from slipping by my assistant till I had quickly, by continuous suture, coapted the edges of the wound, the last stitch coming out just opposite the subcutaneous suture. The silk and catgut are tied here the same as at the other end of wound.

At the angle of the nose a silver pin was passed through the upper edge of the wound to the periosteum, then along the periosteum through the lower lip of the wound, and a figure-of-eight of silk was passed through the pin, coapting the lips of nose wound firmly. Two of these were used; their position is shown on the diagram. Interrupted sutures of fine silk were used to coapt the lips of the wound between the pin-sutures. The nose was straightened and anchored to its position by a strip of surgeon's rubber plaster, started just below the wound on the right side—continued down to tip of nose—around the end of the nose and cut off about one inch from the end of the nose. Two holes were punched in the end of the strip. Another larger piece was plastered on, commencing at the edge of the hair and extending down to one-half inch from the wound. Two holes were punched in it and heavy silk thread was passed through these and laced firmly to immobilize the nose and cheek. Another plaster was started at the angle of the mouth and punched. Another was pressed firmly over the malar bone down to one-half inch of the wound and punctured. The two were laced with silk. Iodoform was sprinkled along the line of the sutures and rubbed gently into all the uneven places around stitches, etc. A small bunch of long fibers of cotton was selected that would reach from the right side of the nose over the nose and down to where the strands of catgut-drain protruded from the lower part of the wound of the cheek. The bunch of cotton was saturated with liquid collodion and

quickly applied, being careful that it was smoothed out, and more collodion added along each edge by means of a small pencil-brush dipped in collodion, to prevent crumpling.

I saw that the drain was open and a bunch of gauze and absorbent cotton placed over it, with a strip of oiled silk over this to prevent drying. The patient was discharged to report on the sixth day, or sooner if there was pain, swelling, pulsation or bleeding.

There are three things that it is almost impossible to overcome which prevent primary union of face-wounds, *viz.*, bleeding, mobility and suppuration. These, I hoped, we had overcome in the case just presented.

A few stitch abscesses resulted; but, after washing them out with peroxid of hydrogen, I passed a crystal of pure carbolic acid down into each, and they healed without leaving a scar.

If we are so unfortunate as to get suppuration, whether it be from the nature of the injury, faulty sterilization or a lack of surgical cleanliness on our part we can do much toward preventing scar-formation by the judicious use of ichthyol ointment upon the granulating surface until a thin film is formed, then protect this from drying and consequent exfoliation by the use of lanolin and benzoated lard.

Skin may be formed over extensive granulating surfaces by "Island Grafting" and following this method.

CLINICAL APPLICATIONS OF EXPERIMENTAL EVIDENCE OF A RESEARCH INTO COLLAPSE AND SHOCK

BY GEORGE W. CRILE, M. D., CLEVELAND

Being the concluding portion of the Cartwright Prize Essay for 1897

[The complete essay has been published by the J. B. Lippincott Company, Philadelphia. The absence in Cuba of Dr. Crile, on duty as Brigade Surgeon with Gen. Geo. A. Garrettson, in the First Brigade of the Second Division of

the Second Army Corps, rendered it impossible for the editor to arrange for the publication of this paper, even had the author desired it.—*Ed.*]

DISCUSSION

Dr. D. Tod Gilliam, Columbus: I arise because I feel that the paper is too valuable to go without notice. It is based on very careful and scientific research and the deductions are sustained. If it is not discussed it will not be from lack of merit in the paper, but probably from a sense of diffidence. I confess to the latter, hence I shall not attempt to discuss it. I do not feel capable of discussing it. I believe that I voice the sentiment of all present when I reiterate that it is one of the most valuable and instructive papers presented during the session.

Dr. F. F. Lawrence, Columbus: I want to call attention to a few things this research emphasizes, that is, the value of rapid work, short operations, and small incisions, in abdominal work particularly, in such manner as to avoid, as much as possible, handling the intestines. It is shown by experiment that blood-pressure is lowered by catching hold of the intestines. The shorter the exposure, the shorter the time, the greater the safety from shock. It seems this paper is one of more than ordinary value. It is the research not of days or of months, but of years. I think we are all deeply indebted to Dr. Crile.

Dr. Y. Wardlow, Columbus: Although I have been unable to be present in time to hear his entire paper, I have read other contributions by Dr. Crile on this same subject previously published. I want to express my admiration at the completeness and thoroughness with which he has made his observations. Among other things I am especially impressed by one fact which has been brought out: that shock is produced, not so much by handling the peritoneum a long time at one spot, but by handling it over a large area—a fact worth remembering.

I think this is not only one of the best papers read in this society, but one of the most valuable contributions to abdominal surgery in this country for a number of years. All abdominal surgeons owe Dr. Crile a debt of gratitude.

Dr. C. F. Clark, Columbus: I regret Dr. Crile was obliged to abbreviate his paper. I would like to ask one thing, if his experiments have led him to any conclusions in this field, if he will kindly summarize to some extent his deductions as to the best means to pursue when shock has actually begun.

Dr. J. B. May, New Holland: I would like the gentleman to tell us what effect dilatation of the anal sphincter has in overcoming collapse.

Dr. D. W. Greene, Dayton: I am very much pleased with the paper and very sorry there were not more here to hear it. It is of vast interest to the general practician. As the doctor has suggested, shock is very often over-treated by heroic doses of medicine.

Dr. Crile, closing: In reply to the inquiry as to how to best treat shock after it is in existence, I would say in a general way that the treatment must be very general and cannot be local. While the cause may be local, the treatment must be general.

There is very little doubt that the subcutaneous injection of saline solution, together with strychnin, is by all means the most effectual method of treating shock. My observations are not so full in this line as I hope to make them later. I wish to take just a moment to explain that if the body is tipped downward, there is total collapse of the circulation, because the tone of the vessels is lost. Blood settles in the vessels and there is no force to bring it back. The vasomotor center is incapable of bringing the blood back to the heart. Posture is a great point. In a given case, if you secure a posture with the head downward and give a venous or subcutaneous injection of saline solution and strychnin, but not over-stimulate, I believe that to be the best method of treating shock.

Now, in answer to the inquiry about dilatation of the anal sphincter: It does increase respiration. This is not of as much value in treating shock as in collapse due to failure of the respiratory center. The difficulty is as you repeat it; it produces less effect each time. Artificial respiration is of more value. What stretching of the anal sphincter will do, artificial respiration will do. Another thing. The anesthet-

izer may think the patient is coming out of the anesthetic. He gives more anesthetic and produces collapse. The same is true of abdominal operations. Manipulation of the intestines causes increased respiratory action.

I thank the Society for its indulgence and for the kind expressions of the members.

THE TREATMENT OF TUBERCULOSIS OF BONE

BY FRANK WARNER, M. D., COLUMBUS

Professor of Operative and Clinical Surgery Starling Medical College; Surgeon to Children's Hospital

Tubercular deposit in bone had long been suspected before its real character had been proven—before it was possible to prove it by Koch's *bacillus tuberculosis*. There are often so many associated features of a tubercular nature that tubercular bone needs no other proof but them.

The diagnosis of tubercular bone is usually attended with slight difficulty. If we remember its favorite seats of assault and the youthfulness of the patient generally assaulted, we will not be led astray in diagnosis, and with the proper diagnosis, much less likely to institute improper treatment.

The hip-joint, or, as I am speaking of tuberculosis of bone alone, the epiphysis near the joint, the bodies of the vertebra, about the knee-joint, ankle-joint, in the tarsal bones and carpal bones, and in children the phalangeal bones, are the places we are most frequently called upon to treat tuberculosis of bone. The tibia is infrequently assaulted. Nowhere are the results of early treatment more manifest; nowhere more destructive than in this very class of cases.

If taken early, I am satisfied that a great many cases of slight tubercular bone affection subside in a short time by rest alone. Especially is this true when the tubercular process starts from slight injury, as about the hip-joint, for

rest lessens the general hyperemia and, with this lessened, the tubercular process is diminished or abolished. This is equally true about the vertabræ under like conditions, although so many times we find Potts' disease developing without any history of real injury to these bones. So much of the value of rest is in causing the acute results of the injury to subside. But in either event early rest is of the greatest value. This rest must not be too long-continued at the expense of fresh air, light, sunshine and some general exercise. If we do you will begin to see the patient growing excessively pale, the muscles becoming flabby, the appetite poor, and the general expression of a patient who is progressing in the wrong direction.

If we are not able to early correct a tubercular infection of this character—and I am lamentably aware this is so often a fact—then we must consider our operative procedure.

Wherever a tubercular deposit is readily accessible, I do not hesitate to make an early incision and curet the bone thoroughly, pack the cavity with sterilized iodoform gauze, and then do whatever can be done in the way of building up the patient by general tonics, cod-liver oil, and admitting as much fresh air to the room as is compatible with comfort; not forgetting at the same time to admonish those in charge of a private residence the necessity of admitting as much light or sunshine as is possible. We must not lose sight of the fact that light is an eternal enemy of the *bacillus tuberculosis*. So many times we see the shades of the sick-room drawn. Let the bed be so arranged that the patient's eyes will look toward the wall and not the window, then the necessity of shading the room will not exist.

It is always a difficult matter to know when you have sufficiently curetted a tubercular bone; but it is much better to err on the side of thoroughness than to subsequently find your curettement has been insufficient to stop the carious process. A small nidus of infection left may be

sufficient to again start up a carious process which may finally result in the total destruction of the bone.

It is always an important problem to know just what to do with large tubercular abscesses when the carious bone which produced them is so deeply seated as to be not readily accessible. I am not willing to say an inaccessible bone, for I know not what time some surgeon will regard the tubercular bodies of the vertebra best treated by curettement of the focus of infection.

If these large cavities could always be well and constantly drained, then free incision should be practiced. Or, if they could be kept aseptic even with limited drainage a like practice should be instituted. So many times neither of these ideal states can be obtained.

When it has seemed likely there is going to be great difficulty in maintaining a constant aseptic condition of one of these large abscesses resulting from tubercular bone, then the aspirator should be used conjoined with injection of iodoform emulsion. But this process is slow and not an ideal one by any means, but preferable to a prospective septic infection of one of these large abscess cavities. The aspirator has, however, only a limited field in the treatment of the results of tuberculosis of bone. Where a cavity can be so arranged as to be thoroughly flushed daily with an antiseptic solution, no fear need be entertained either as to complete drainage or septic infection of the cavity. When this is the case, no hesitancy should be used in selecting incision as the best mode of treatment. In cavities that are at all deep it is always better to secure a counter-opening. Cavities can then be flushed that it would be impossible to cleanse in any other way.

By thoroughly cleansing the cavity, septic infection is prevented that would otherwise beget a periostitis and ostitis that will not only add to the destruction of bone, but by the hyperemia occasioned produce a most favorable con-

dition for the extension and perpetuation of the tubercular disease of the bone.

The favorite seat of assault is the cancellous structure of bone. While the long bones are the favorite seat of attack of syphilis and seldom of tuberculosis, I recently saw a typical case of tuberculosis of both tibiæ and fibulæ at the Children's Hospital which yielded readily in one leg to a trephining of the tibia and a curettement of the diseased area in the fibula. The destructive process in the other leg, through an extensive rarefying ostitis, was such as to demand an amputation. I am satisfied that a much longer delay in treatment would have necessitated an amputation of that leg as well, for there was found a tuberculous mass in the cancellous structure of the tibia, a somewhat diffused rarefying ostitis with considerable swelling of the bone. An unbroken periosteum only added to the tension of the swollen bone, which in turn could only increase the rarefying ostitis. By trephining this class of cases at the point of greatest swelling, we not only get rid of a considerable area of infected tissue, but at the same time lessen the tension upon the bone so as to diminish or abort the extension of the accompanying rarefying ostitis, or diminish the likelihood of the destruction of a portion of the bone *en masse*.

While I have spoken of rest as such a prominent factor in the treatment of tuberculosis of the bone, I do not mean we should blindly put to bed all such cases, but where the affected bone can be put at rest by mechanical appliances, a reasonable amount of out-door exercise will be found far more conducive to a subsidence of the tubercular process. The tarsal bones might be put at rest in a plaster-of-paris cast, cut open upon the dorsal surface for inspection, and the patient put upon crutches. The hip-joint in a measure immobilized, or the opposing surface kept separated by braces of one kind or another. Yet, here we must not go too far, for many of these cases do better in bed. A tentative trial of the two methods might be employed and the

one selected for more prolonged treatment which promised most.

In the treatment of tuberculosis of the bodies of one or more of the spinal vertebra, while it often does well by the rest and fixation given by braces, plaster-of-paris casts or leather jackets, yet we must not carry these appliances too far at the expense of rest in bed. Where a knuckle of bone is large and continues to enlarge in spite of your carefully adjusted appliances, it is much better to put the patient to bed for a considerable season, then, later, try the braces again. Seldom, however, do I find the cases of extensive tuberculosis of the bodies of the cervical vertabra benefited by any mechanical appliances, as the jurymast or other contrivance, in anything like the degree of improvement which results from rest in bed alone.

GASTROSTOMY FOR STRICTURE OF THE ESOPHAGUS

BY EARL M. GILLIAM, M. D., COLUMBUS

Frank D., age 59, widower, occupation laborer, residence Canal Dover, Ohio, was admitted to St. Anthony's Hospital October 23, 1897, for treatment of esophageal trouble.

I saw him the next morning and obtained the following history. His health had always been good up to last July, when he was suddenly taken with an inability to swallow solid food. This grew worse rapidly and by the latter part of August he was compelled to subsist entirely on liquids. In ten weeks he lost nearly fifty pounds. Family history good, no evidence of trauma, syphilis or tuberculosis. On introducing a bougie into the esophagus a stricture was revealed near the juncture of the middle and lower portion of the tract. Daily introductions of the bougie having failed

to accomplish the slightest improvement, an operation was suggested to which the patient readily consented.

On the morning of October 30, gastrostomy was performed by Ssabanajew-Franks method. An incision three inches long was made along the left costal border into the peritoneal cavity. The stomach was drawn out of the opening a sufficient distance and the abdominal cavity completely shut off from the field of operation by introducing interrupted silk sutures through the muscular and peritoneal coats of both stomach and abdominal wall.

One and a half inches to the left, and parallel to the first, a second incision was made, but only skin deep. The two incisions were then connected by tunneling beneath the integument, and through this passage the tip of the gastric fold was drawn and sutured to the margin of the second opening; meanwhile the first incision was closed.

Although the operation consumed but thirty minutes, the patient was greatly shocked. Nevertheless, applications of hot-water bags and injections of strychnin caused him to rally nicely.

The stomach was opened on the fourth day and a rubber catheter inserted, through which hot water and milk were injected. Three days later a larger tube was substituted for the catheter, and by attaching a funnel to it the patient managed to feed himself. In less than four weeks he gained twenty pounds.

Six weeks after the operation he contracted a severe cold and was confined to bed three days, complaining constantly of excruciating pain in the region of the heart. On getting up for the first time he started to walk across the ward, but had taken only a few steps when he suddenly fell to the floor and expired. A postmortem was held that morning. The heart was found enlarged and covered with a material closely resembling colloid. The lungs, liver and stomach appeared healthy. The diseased part of the esophagus was removed for careful examination later on. I was

FIG. I. GASTROSTOMY FOR STRICTURE OF THE ESOPHAGUS.

fortunate in obtaining two photographs of this case; the first was taken on the tenth day following the operation and the second at the time of postmortem. Fig. 1. (A) shows the cicatrix of first incision and also the tube *in situ*. Fig. 2. (A) clearly demonstrates the successful union between the abdominal and visceral parietes.

Dr. Upham of this city, to whom I am greatly indebted, kindly consented to examine the specimen, and reported it to be malignant. The lumen at the site of constriction was but one-eighth of an inch in diameter. No rupture was found. Gastrostomy was suggested by Egeberg of Norway, in 1837. He believed that, in cancerous or cicatricial stenosis of the esophagus, there was a possibility of prolonging life and relieving suffering by establishing a gastric fistula. Nothing was done until 1849, when Sedillot, of Strasburg, performed the first operation.

In 1874, Sidney Jones of London and Jacobi of New York reported the first successful cases. Prior results were almost invariably fatal. Gross collected 207 cases, of which 29.47% succumbed to the operation itself. Zesas gathered from different sources 162 cases, showing a mortality of 60% for cicatricial stenosis and 84% for malignant growths.

But few of the many methods devised for performing gastrostomy succeed in preventing leakage. This is of the greatest import; not only does the patient's comfort but also his nutrition depend upon it. The methods of Witzel and Ssabanajew-Frank are best adapted to combat this disagreeable condition, but unfortunately they are very much restricted, being applicable only in persons having lax stomach walls.

Witzel prevents leakage by infolding a tube into the anterior wall of the stomach, thus establishing a long narrow fistula. The objectionable feature in this operation is that the viscus has to be opened at once, thereby increasing the risk of sepsis. But must we be deterred from using the method, even if the chances of infection are augmented?

I answer, No. In extreme exhaustion and emaciation it should be done, as the immediate introduction of food is imperative, but where conditions are more favorable for delay the method *per se* is that of Ssabanajew-Franks. In contracted stomachs this operation is proscribed, in fact it is sometimes almost impossible to bring the viscus to the abdominal wall.

No matter what method is used, great care must be exercised in order not to mistake the colon for the stomach. This error has been made by several surgeons. In case of doubt the best plan to pursue is to search along under the surface of the left lobe of the liver, and the first structure touched after leaving it must be the stomach.

When the rectus muscle is reached, in making the first incision, guard against using the blade of the knife, but substitute its handle for separating the fibers. The object in doing this is for the purpose of preserving as much contractility of the muscle-fibers as possible and thus acting as a sphincter to the canal, preventing leakage.

E. J. Senn of Chicago, has recently brought forth a new method which consists in making a valve of the stomach wall itself. After entering the abdominal cavity, the stomach is grasped near the greater curvature and pulled out in the form of a cone. Two puckering strings of chromacized catgut are then placed parallel to each other, two and one-half inches below the apex of the cone, the sutures including the serous and muscular coats. These sutures when drawn tight form an isthmus. A portion of the gastrocolic omentum, the serous and muscular coats of the stomach constriction by means of silk.

The stomach is fastened to the parietal wound with silk sutures which include the upper portion of the cuff of omentum, the serous and muscular coats of the stomach and all of the abdominal wall except the skin.

The skin is closed with silkworm-gut sutures, leaving visible the portion of the stomach which is to form the valve.

FIG. 2. SHOWING FIRM AND COMPLETE UNION.

The stomach can be opened at this time or later, whichever is desired. The opening is made in the center of the portion exposed, and should be one and one-half inches in length. A rubber tube is passed into the stomach; the stomach wall is now inverted, forming a circular valve and the inversion is maintained by Lembert sutures.

The author reports one case, there being not the slightest leakage. Abbe of New York, has also performed Senn's operation and reports that the plan is very satisfactory.

In closing I desire to state: Firstly—gastrostomy must be considered a palliative and not a radical operation; secondly—the earlier we operate, the better the chances of success; thirdly—no one method will answer in all cases, the one which seems best adapted to the situation should be selected, and fourthly—great care must be exercised not to mistake the colon for the stomach.

TUBERCULOSIS OF THE MAMMARY GLAND

BY ALBERT H. FREIBERG, M. D., CINCINNATI

Until very recent times tuberculosis of the breast has been considered one of the rarest surgical conditions, and especially true is this of primary tuberculosis of this gland. Prior to 1880 we find practically no mention of this condition in surgical treatises, save by Velpeau and Astely Cooper. Billroth, in his classical monograph on diseases of the breast, regarding all previous reports on this subject as inaccurate and lacking histologic confirmation, mentions a case of undoubted tuberculosis of the breast found postmortem in a woman who had died of pulmonary and intestinal tuberculosis. Since this time reports of these cases have multiplied, although the total number of authenticated cases of primary tuberculosis is still cosiderably below fifty. Of this number, less than ten have been contributed by our own countrymen, two of them having been reported by

Powers of Denver. In view of the fact that the diagnosis is by no means always easy and particularly early in the course of the disease, and regarding the manner in which case reports have been added since attention has been drawn to this subject by clinicians it is fair to presume that the condition of breast tuberculosis is more common than has been heretofore supposed, and that more cases will be brought to light as a growing familiarity with the clinical manifestations makes its recognition possible.

The following case came under my observation, having been under the care of Dr. John Irvine of Tolesboro, Ky. Miss Lizzie B. D., age 31, unmarried, weight 108 pounds, rather tall and of slight physique. She was admitted to my service at the Presbyterian Hospital on November 22, 1897. Both of her parents are living and well. She has four brothers and six sisters living. One brother has pulmonary tuberculosis and one sister is in poor health. Two cousins died of consumption.

The patient had measles at the age of 20; since then she has had a slight cough with a small amount of frothy expectoration. She has never had pulmonary hemorrhage. Four years ago she had pneumonia from which she recovered slowly. In January, 1897, she noticed a swelling in the left axilla which was painful. It was quite large, and, anticipating suppuration, flaxseed poultices were applied. Suppuration failed to occur, however, and in time the swelling disappeared. Two weeks after its disappearance she noticed a swelling in the upper and outer quadrant of the left breast; this also was poulticed and disappeared without breaking down. Both of these conditions were quite painful; the pain, without being constant,was sufficiently severe to interfere with sleep frequently. It is described as having been lancinating and radiating from the breast into the axilla and down the arm. It is further described as bearing no relation to the occurence of menstruation. Gradually swelling and hardening appeared around the left nipple and

during the last two weeks a certain amount of softening seems to have occurred; her temperature was 99.2°.

The physical examination showed slightly roughened breathing at the right apex and also slight lengthening of the expiratory murmur; lungs otherwise normal; heart normal. There was considerable enlargement of the left breast the areola was enlarged and of a dark cyanotic hue; the nipple was not retracted. The region of the areola is soft and fluctuation can here be made out. Immediately beneath and surrounding the nipple there is felt a hard mass intimately connected with the glandular tissue but freely movable upon the chest wall. The skin was freely movable over this mass except in the region of the areola where it was in places adherent. Manipulation and pressure were decidely painful. There was no enlargement of the axillary glands to be made out. Aspiration at the point of fluctuation yielded a small quantity of pale fluid in which tubercle bacilli were afterwards demonstrated in small number.

The patient was operated upon November 23, 1897. An incision was made into the mass from the nipple towards the axilla. A cavity was entered, about the size of a hickory nut and a quantity of thick cheesy pus evacuated. The entire breast was removed. In view of the entire disappearance of the former enlargement the axilla was not entered. The patient was allowed to return home on November 29, one week after admisson, primary union having occurred.

On April 6, 1898, Dr. Irvine assured me that the patient has remained perfectly well. By inadvertence, the specimen which had been ordered preserved for histologic examination was lost and I am therefore unable to describe the microscopic appearances. Macroscopically the mass presented a cavity lined with characteristic tubercular granulation tissue and surrounded by an infiltration rather firm in character and extending from the principal mass chiefly toward the axilla. This, together with the discovery of

tubercle bacilli leaves no doubt in my mind as to its tuberculous nature.

Studied from an etiologic point of view it seems rather remarkable that the breast should so seldom be found the seat of tuberculous disease. Its anatomic relations and its structure and physiology are such that a frequent tubercular infection would seem, *a priori*, probable. But were we even disposed to grant that it escapes clinical recognition fairly often, it must still be regarded as an infrequent occurrence. Powers states that of 185 cases operated on for breast neoplasm, conditions other than mastitis, but one case of tuberculosis was found; and they were all examined microscopically.

The determination of the infection in this particular locality has been explained in three ways—first, a direct infection through the milk-ducts; second, an infection through the medium of the blood-current; third, by means of the lymph-vessels. To these should be added infection by direct extension from a focus primarily situated in one of the contiguous structures. It is true that in this case we should not be dealing with a primary breast tuberculosis but as Recnick has shown the primary focus may be very insignificant clinically or even altogether undiscoverable. Direct infection from without, such as might take place through a fissured nipple or through the milk-ducts, and infection by means of the blood current can very rarely be proved, but that pregnancy and lactation do exert an influence in this regard is shown by cases reported by Habermaas, Orthman, Davis and Hanks. The theory of infection through lymphatic channels is lent strength, as remarked by Delbet, by the fairly frequent initiatory swelling of the axillary glands. He speaks of no less than seven cases where the affection of the axillary glands was the original clinical manifestation. This must require, however, a retrograde lymphatic metastasis, a condition which must be looked upon with a degree

of incredulity. It would seem more likely that in such cases we had to deal with a primary focus in the breast of inconsiderable extent and overshadowed clinically by the secondary glandular infection.

In at least one half of the cases the disease is secondary to tuberculosis elsewhere, most frequently, of course, in the lungs, but by no means unusual in the tissues of the neighborhood of the gland. We must therefore acquiesce with Recnick in considering only those cases as primary in which tuberculous disease of contiguous structures can be excluded or where it can be shown to have occurred secondary to the disease of the mamma.

Pathologically the disease has been described as occurring in two forms: the disseminated and the confluent, the latter of which is by far the more common.

In this form we have to deal with one, or less often several, fairly large nodules, varying in their consistence and appearance upon section according to the amount of caseation or liquefaction which has occurred. Microscopically we find the formation of more or less typical tubercles with their epitheloid and giant-cells and accompanying round-cell infiltration. Characteristic also are the degenerative changes, but especially, of course, the existence in the tissue of the tubercle bacilli. Sooner or later there appear marked caseation and liquefaction and finally secondary infection with pyogenic organisms; there results then the formation of cold abscess and sinuses just as in tuberculous processes elsewhere.

Clinically, primary breast tuberculosis presents itself in a variety of ways. It is probable, from a study of the clinical histories, that not infrequently the condition escapes recognition for a long time, not only by the physician, but by the patient. This is likely to occur when the disease progresses slowly in an individual otherwise healthy. Thus Shattock (*Trans. Path. Soc.*, vol. xl, p. 391) reports the case of a girl 21 years of age who six years before noticed a lump

the size of a hazelnut in the left breast which was occasionally the seat of slight and transient pain. During the last year the axillary glands were enlarged. Upon removal and histologic examination it proved to be typical tuberculosis. On the other hand the condition may be painful in its very incipiency. Not infrequently there is no pain whatever complained of, until with the advent of secondary infection an acute inflammatory condition develops. As before remarked, the axillary lymphatic enlargement is the first symptom in a considerable proportion of cases. (Delbet *loc. cit.;* also Gaudier et Péraire.) In other cases this lymphatic enlargement has been absent altogoether during the whole course. However, the enlargement of the axillary lymphatics occurs at one time or other in 75% of all cases and according to Delbet suppuration occurs in them as a rule before it does in the breast itself. The physical examination of the breast will, as a rule, disclose a tumor, rather ill-defined, closely connected with the gland substance, but freely movable upon the wall of the chest and beneath the skin of the breast. The edge of the mass has not the sharply confined boundary characteristic of simple chronic mastitis and not infrequently processes extend from the principal mass, similar to those of carcinooma. The induration is most frequent in the external segment of the gland and occasionally a firm cord of enlarged lymphatics may be felt continuous with those of the axilla. In consistence the mass is rarely uniform, save in its very earliest stages. Usual is the occurrence in some place or places of softened areas or even pronounced fluctuation. In some chronic cases retraction of the nipple has been described.

This disease is one of young adults chiefly; more than one-half of the cases have been described as occurring between the ages of 25 and 35, and in women with very few exceptions.

Our chief interest breast tuberculosis must be centered in the diagnosis. When liquefaotion has progressed to a

considerable degree, when sinuses have formed or when the condition affects a very young woman of pronounced tuberculous habitus, the diagnosis may be extremely easy; on the other hand, when found in one more advanced in years, say 35 or over, and especially when but little softening has occurred carcinoma may be ruled out with the greatest difficulty, or not at all. This may be true also of chronic simple suppurative mastitis, or even of the chronic interstitial form. Where any degree of softening has occurred an exploratory aspiration may determine the diagnosis definitely, as in our own case, by the withdrawal of broken down material in which tubercle bacilli may be found.

A perusal of some of the casuistic literature on the subject of chronic suppuration of the breast has brought me to the conviction that primary tuberculous disease of the breast is far more common than has been supposed. The application of modern methods of diagnosis and the examination for tubercle bacilli in particular, together with a more accurate knowledge of the clinical manifestations of mammary tuberculosis will, I truly believe, cause many cases formerly classed as simple chronic abscess to be placed under the rubric of tuberculosis. This refers especially to those cases occurring in quite young, unmarried women, with no cause apparent for the occurrence of abscess.

As example I might cite a case reported by Marcus and operated on by Ransohoff. A girl of 17 years, unmarried and without tubercular family history, had been suffering for years with severe pains in the breast for which a physical basis could not be found. Rather suddenly there developed the symptoms of acute suppuration. Upon being incised, pus was discharged, but a fistula remained, necessitating a second operation, at which the gland was found riddled with suppurating foci. The pus was not examined for tubercle bacilli. In conversation with Dr. Ransohoff he acknowledged the likelihood of its having been tuberculosis. The

patient is known to be at present in the enjoyment of perfect health.

The prognosis of breast tuberculosis is about what we might assume it to be from *a priori* considerations. If treated by radical surgical intervention a recurrence *in loco* is in the extreme improbable, but the disease, betokening by its very presence a lowered power of resistance to the invasion of the tubercle bacilli, and possibly an environment favorable to their development, is apt afterwards to appear in other organs, the lungs in particular, and thus bring about a fatal termination. This has been found the later history in quite a number of the cases which have been followed up sufficiently.

In the treatment of mammary tuberculosis we have but to follow well-recognized surgical principles. With Robinson and others, I believe it unnecessary to enter the axilla unless there is an appreciable enlargement of the lymph glands. In refraining from partial operations upon the breast itself and making the amputation in every recognized case of primary mammary tuberculosis, I believe we can err only on the side of wisdom.

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CHAPTER V

MEDICINE

CARDIOPULMONARY MURMURS

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In reviewing the history of the subject of cardiopulmonary murmurs there are other reasons than usage that demand a reference to the work of Laennec. Though Laennec's conception of the cardiac cycle was incomplete and incorrect, he nevertheless realized that there were certain adventitious sounds heard over the precordial area that could not originate within the heart. Laennec ventured to explain the origin of these adventitious sounds or murmurs by placing it in the lung and making them dependent upon the cardiac cycle. The fact, however, that the supposed extracardial murmur persisted with cessation of respiration left Laennec in doubt as to the explanation of the phenomena; so that in the writings of Laennec the explanation of the so-called functional murmurs is left in suspense.

In Virchow's *Handbook*, vol. v, 1854, Wintrich says that he has often heard during the cardiac contraction a soft blowing murmur, inspiratory in character, which he believed to be due to the aspiration of a cavity caused by the diminution in the size of the heart during its systole. He says he sometimes heard dry and moist râles dependent upon the cardiac systole. On one occasion, in the case of a young girl, he heard a high-pitched whistling sound, over a cavity near the heart, which accompanied every systole.

Wintrich claimed also to have heard an aspiration sound and râles over a pneumothorax when the lung fistula was in the neighborhood of the heart.

In the London *Medical Times and Gazette*, 1860, Benjamin W. Richardson, in an article entitled "On an Auscultatory Sound produced by the Action of the Heart on a Portion of Lung," says, in describing a sound heard over the base of the heart to the left of the sternum: "The sound was so superficial that it seemed directly beneath the stethoscope, or, if the ear were applied, in immediate contact with the ear. It was not a friction-sound, it was not a murmur, it was not a crepitation; it was rather a crackling, coarse sound, resembling comewhat the burning of dried gorse or the tearing of a piece of calico." The sound disappeared during forced expiration. At the necropsy a tongue of lung was found directly in this area, firmly adherent to the thoracic wall anteriorly and to the pericardium posteriorly. In a second case the same sound was audible during life. On necropsy the lung was found adherent to the thoracic wall and dragged down over the heart. There were no adhesions of the pericardium. After filling the lung with air through the trachea in this same position, and then compressing the lung with the hand, he could produce the same sound. Richardson later named this phenomenon "pulsatile pulmonic crepitation," because, he says, the same sound could be produced by the aorta.

In *Allg. Wien. Med.-Ztg.*, 1863, Skoda says: "We must further mention a murmur which originates in the following manner: A portion of lung protruding upon the heart is compressed by the heart during its excursion, thus expelling the contained air and producing a hissing sound." Skoda says further that it is impossible to differentiate such a murmur from a murmur that may occur in the *conus arteriosus* and may be due to some modification of the blood.

Choyan (*Paris Thesis*, 1869) described the second case

in this thesis as one in which there were no lesions of the heart found at the necropsy. During life, over the mesocardium and the second interspace at the left border of the sternum, there were moist râles heard with the systole of the heart when respiration ceased. The lung was infiltrated with a tubercular process and fixed between the left ventricle and the thoracic wall. In the third observation there was a cavity of the upper right lung extending as far down as the third rib; and during life, over the sternum at the level of the third rib, gurgling and moist râles were audible with the heart's systole when respiration was suspended. Several similar cases are described by Choyan. In the eighth case there was no disease of the lung, but during life a murmur was distinctly heard over the left ventricle during the expiratory phase and disappeared during the inspiratory phase.

Dr. N. Weiss (*Wien. med. Wochenschrift*, 1880) describes three cases which gave loud diastolic murmurs audible over the region of the left ventricle at the third interspace and apex. There was no disease of the valves. Neither the relation of the lungs to the heart nor the relations between the right and left ventricle are accurately described. He remarks that the one case described by Friedreich, and all of his own cases, had tuberculosis of the lungs.

The possible presence of a presystolic murmur without mitral stenosis or disease of the valves occasioned a controversy between Austin Flint, of America, and G. Balfour, of Edinburgh. This controversy waxed so warm that G. Balfour intimated that Austin Flint was unable to hear a murmur correctly. In an article in the *American Journal of Medical Sciences*, 1886, Austin Flint resents the imputation of Balfour and describes cases giving the presystolic murmur without any lesion of the valves. The murmurs described by Flint have all the characteristics of cardiopulmonary murmurs.

The most common location of the cardiopulmonary murmur is over that portion of the precordial area which en-

joys the greatest degree of anteroposterior excursion during the cardiac systole. This is over the *conus arteriosus dextrum,* or what is commonly clinically described as the pulmonic area.

Naunyn sought to explain the frequent occurrence of systolic murmurs over this area without mitral endocarditis, by attributing the murmurs to actual regurgitation due to relative insufficiency of the mitral valve. Naunyn says the murmur is audible at this point because of the proximity of the appendix of the left auricle. Balfour, of Edinburgh, has accepted the explanation of Naunyn and given it wide circulation in England and America. If genuine regurgitation were the cause of a murmur in this region the physical principles of the transmission of sound demand that the murmur should be audible at the apex of the ventricle as well as over the appendix of the auricle.

Potain has shown experimentally that postmortem the mitral valve will withstand an intraventricular pressure high enough to rupture the wall of the ventricle. The resistance of the mitral valve and ring makes relative insufficiency of the mitral valve improbable, especially when antemortem and postmortem there are no evidences of dilatation of the left ventricle. It may be urged as an objection to this ground that we have positive clinical evidences of a relative insufficiency of the tricuspid valve during life when the postmortem shows no evidences of an endocarditis in the right ventricle. The centrifugal venous pulse, systolic in time, which is plainly visible in the external jugular, and manifests itself in the liver by a systolic expansion of this organ, is sufficient evidence of a relative insufficiency of the tricuspid during life. Potain finds, however, that very low pressure in the right ventricle is necessary to spring the tricuspid valve.

The so-called functional or hemic murmur, which I believe to be often a cardiopulmonary one, is frequently found in chlorosis and anemia. There is no constant rela-

tion, however, between the dilatation of the heart and the existence of the murmur, nor is there an essential relation between the blood-count and the presence of the murmur. A fatal objection to the murmur being hemic in origin is the fact that the murmur is heard mostly over the pulmonic area and not over the aortic area. The blood passes through a tube with a more constant lumen from the *conus arteriosus dextrum* into the pulmonary artery than from the *conus arteriosus sinistrum* into the aorta. The blood in the aorta is driven more rapidly, and under a pressure from four to six times as great, as is the case in the pulmonary artery. These physical conditions demand that were the murmurs hemic in origin they should he heard more constantly and with greater intensity over the second interspace to the right of the sternum than over the second interspace to the left of the sternum. The chemical change which the blood undergoes in the pulmonary circulation could not be responsible for the murmur being heard over the pulmonary artery and not over the aorta. Thus, by exclusion (without positive evidence), we are forced to admit the so-called functional pulmonic murmur under the head of cardiopulmonary murmurs.

Before we proceed to discuss the characteristics of the cardiopulmonary murmur it would be well for a few moments to consider the interpretation of the cardiac activity as seen and felt over the chest-wall, and to define the relation of the various phases of the cardiac cycle to the phases of cardiac excursion.

A great source of error in timing murmurs over the heart is due to a misinterpretation of the cardiac impulse. The interpretation of this impulse, as described by Vaquez, is the one that is most acceptable to my mind. The palpable apex-impulse is divided into two phases: First, a progressive elevation; secondly, an instantaneous impulse. The auricle contracts, filling the ventricle until tension on the ventricular wall announces the commencement of the ven-

tricular systole, at which instant the auricular systole ceases and the expulsion begins, the auriculoventricular valves being closed. This closure is responsible for the sharply defined impact which terminates the systolic impulse of the ventricle. Over the apical region the impulse does not sustain a constant relation to the cardiac cycle. The time of the impulse depends largely upon the conformation of the thorax and the relative position of the heart in the mediastinum. Sometimes the intercostal space is protruded by the apex; sometimes the impulse disappears, giving what Marey called a "negative impulse." This paradoxic term was selected by Marey to describe the simultaneous recession and hardening of the apex during the systole. The closure of the mitral valve may follow the commencement of the systolic impulse, may precede the palpable impulse, or may be synchronous with it.

The more accessible the heart and the larger the precordial area of activity the more readily can we identify the phases of the impulse with the phases of the cardiac cycle. It is a common clinical practice to estimate the beginning of the cardiac systole with the beginning of the impulse. For this reason the pulse of aortic insufficiency and the pulse of mitral stenosis are described as being delayed. The delay is only apparent. The first portion of the cardiac impulse in both instances is diastolic. The estimated lapse of time between the closure of the mitral valve and the carotid pulse in cases of mitral stenosis and aortic insufficiency is found to be what it normally is—*viz.*, about twelve one-hundredths of a second. In the London *Lancet* of 1887 Dickinson speaks of the "error" of calling the socalled "murmur of mitral stenosis a presystolic murmur, when it is really a murmur of insufficiency." The error is Dickinson's, because he failed to recognize the auricular element in the elevation of the ventricle.

In making a clinical examination of the heart, what we really palpate and inspect is not the apex-impulse alone,

but the increase in the anteroposterior diameter of the heart. The apex-impulse is merely incidental to this anterior heaving of the heart. The term apex has come into common use because that portion of the heart is most commonly accessible to view and to touch. When the heart is dilated or the lungs retracted we say the apex-impulse becomes broadened. What really occurs is the increase in the anteroposterior diameter of the heart becomes accessible over a larger portion of the ventricles. As I have remarked above, this increase in the anteroposterior diameter of the heart may be partly produced by the systole of the auricle and is not occupied entirely by the ventricular systole. The beginning of the ventricular systole is marked by the closure of the atrioventricular valves. Observers differ widely upon what point in the cardiac elevation the closure of the valves occurs. Fig. *a*, taken from Vaquez, marks the points

in the cardiographic tracing where various observers have placed the closure of the mitral valve. The lowest one is marked by P. Hilbert, the second by Martius, the third by Landois, and the fourth by Marey. The point marked by Marey is the one accepted by the school of Potain. Roy and Adami would accept the point of Martius, and would interpret the point of Marey as being due to the contraction of the papillary muscles. It must be noted, however, that the tracings of Roy and Adami, on which they base their interpretation, were taken from the exposed hearts of animals and the tracings taken with considerable pressure on

the heart-wall. In the work of Roy and Adami, published in the *Practitioner* of London, 1890, there is a figure presented which is very significant in this relation. They show that the descending arm of the cardiographic tracing becomes smaller as the pressure exerted on the ventricle is diminished. The intraventricular pressure offered by the systole of the auricle can not exceed ten millimeters of mercury. The manifestation of this pressure could be easily obliterated by exerting pressure upon the myocardium. Roy and Adami's tracings are further complicated by the fact that they were taken on the exposed heart, the animal being kept alive by artificial respiration. Under normal conditions the heart is contracting in a medium of a negative tension, which may equal from six to ten millimeters of mercury, caused by the elasticity of the lung. If this negative tension be removed by producing a double pneumothorax the heaving of the ventricle caused by the auricular systole would be still further obscured. A study of the gallop-rhythm has shown, I think, conclusively, how much the auricular systole may share in producing the anteroposterior excursion of the heart. The study of the gallop-rhythm, I think too, shows that the interruption in the cardiac impulse could not be due to an interruption in the ventricular systole; so that the contraction of the papillary muscle, as interpreted by Roy and Adami, could not be responsible for the gallop-rhythm nor the first portions of the precordial impulse which frequently accompanies a cardiopulmonary murmur.

It is common to find in clinical observations the transition from a presystolic cardiopulmonary murmur to the gallop-rythm, just as has been often observed in a genuine mitral stenosis. A cardiopulmonary murmur may precede the systolic tone, may accompany the systolic tone, or occur during the short pause between the systolic and diastolic tone. It rarely accompanies sharply the diastolic tone, but more often directly follows it. So we classify

cardiopulmonary murmurs from their chronicity as being presystolic, mesosystolic, telesystolic, diastolic, and telediastolic.

The murmur may be produced either by compressing the lung between the heart and thoracic wall during any portion of the cardiac impulse or by aspirating a portion of the lung lying in contact with the heart when the heart in any portion of its cycle recedes from the contiguous lung. When the cardiopulmonary murmur is due to compression of the lung it may have either a soft, blowing, or a vibratory character. The latter is the more common. When the murmur is due to aspiration, as is always the case when the murmur occurs during the diastolic phase, it has the soft, blowing character. I have never heard a cardiopulmonary murmur synchronous with the diastolic tone that was vibratory in character.

It may be offered as an objection to the pulmonary origin of these murmurs that the passage of air from the finer bronchi into the infundibula does not occur rapidly enough to produce a sound. That is, in all probability, true in ordinary respiration; but we must consider that the excursion of the lung during ordinary respiration is only one seventh of the possible excursion which the elasticity of the lung would afford. Moreover, the time occupied by the cardiac systole is about one-seventh of the time occupied by an ordinary inspiration, so that if a thin piece of lung were situated between the middle of the ventricle and the thoracic wall, the excursion of that small portion of lung due to its compression by the ventricular excursion may be greater than during ordinary respiration, and would occur in one-seventh the time.*

The cardiopulmonary murmur may be distinctly palpable as a thrill. If one is experienced in the detection of these murmurs and compares the nature of a thrill from this source with a thrill that is endocardial in origin, he will

* *Clinique medicale de la Charité.*

be impressed by the fact that the cardiopulmonary murmur is very superficial and can be palpated directly under the finger. In auscultating, the same superficial character of the murmur is apparent. These murmurs can be heard better and their source be better detected by auscultating with the stethoscope. With the unaided ear over the point of the murmur we can best appreciate the superficial location of the murmur. The transmission of the murmur, or rather the want of transmission of the murmur, assists in distinguishing it from one that is endocardial in origin. These murmurs are generally heard over a sharply defined area and do not gradually fade in their intensity as do usually the endocardial murmurs. Another characteristic is that the murmurs vary in their intensity and character with the different respiratory phases far more than the endocardial murmurs. Very often a loud, sharply defined cardiopulmonary murmur may be made to entirely disappear by having the patient make a forced expiration, or may entirely disappear during a strong inspiratory effort. The murmur may be distinctly audible when the patient is in the upright position and entirely disappear in the horizontal position, or may be absent in the horizontal position and distinctly audible when the patient sits upright.

We see from the foregoing considerations that the production of a cardiopulmonary murmur requires a certain thickness of lung between the heart and the chest wall, or a certain relation between a volume of lung and a portion of the heart, so that inspiration and expiration in the horizontal position or the upright position may cause the murmur to appear when absent or to disappear when present. It is also apparent how a variation in the size of the heart may modify the relations essential for the production of a cardiopulmonary murmur. The murmur may be produced in one individual by a cardiac dilatation, in another individual by changing the position of the heart; and in still another patient a cardiopulmonary murmur, which is present during

dilatation of the ventricle, may disappear after the ventricle recovers its normal size, or the murmur may be absent during dilatation and reappear when the heart recovers its normal size.

It is easy to conceive how a soft, blowing murmur may be pulmonary in origin, but it is not so apparent how it could be vibratory in character. Clinically, experience shows that the systolic murmur is very often vibratory, whereas the diastolic murmur is nearly always blowing in character. This difference I conceive originates in the following manner: When the lung is aspirated there is a uniform flow of air from the bronchi into the infundibula, which would produce a sound like that of ordinary inspiration. When the lung is compressed by an actively contracting ventricle the rapid distribution of air into the various infundibula may occur in rapid succession, thus giving its vibratory character.

The most misleading cardiopulmonary murmur is the presystolic murmur, in consideration of which I wish to offer some clinical evidence.

Case I.—A boy, nineteen years of age, complaining of fever, chill, severe frontal headache—temperature, 101° F.—was admitted to the hospital in September, 1897. The physical examination revealed no pathologic signs in the lungs or abdominal viscera. The pulse was rapid, rhythmic, regular, of small volume, and with relaxed arterial walls. The heart was enlarged slightly to the left, the apex one finger's-breadth outside the nipple-line. There were no evidences of hypertrophy or dilatation of the right ventricle. Closure of the pulmonic valve was not palpable, though moderately accentuated. Palpating over the apex, one could feel during the first portion of the cardiac excursion a distinct thrill, which was very superficial. The impulse terminated in a sharp, valvular impact. Accompanying the thrill was a negative venous pulse in the external jugular vein. There was no positive venous pulse nor other evi-

dence of tricuspid insufficiency. Auscultation revealed a murmur of moderate intensity, sawing in character, which sharply preceded the carotid pulse and the valvular tone. The systole terminated in a sharp, high-pitched, valvular tone. The murmur was confined sharply to the apical region. If the patient were requested to make a forced exp'ration the thrill was no longer palpable, and auscultation showed the disappearance of the murmur and the presense of the prolonged systolic tone not quite amounting to the gallop-rhythm. In two days the patient's temperature became normal, all subjective signs and the murmur and thrill entirely disappeared.

Exactly the same phenomena I have observed in a case of chlorosis, which disappeared with the improvement of the condition of the blood; also in a case of severe secondary anemia and in typhoid fever. In all of these cases the thrill and the murmur preceded the valvular tone and were synchronous with the negative venous pulse. Exactly the same signs would occur in any case of mitral stenosis. The differentiation could be made, however, on the ground that the murmur and thrill disappeared during the expiratory phase and all evidences being essentially those of a dilatation of the left ventricle, and the absence of any evidence of hypertrophy and dilatation of the right ventricle, as we would expect to find in mitral stenosis. The subsequent course of all these cases disproved the presence of an endocarditis.

Another case was that of a woman, gracile in development, in whom the diagnosis of a hypoplasia of the aortic system seemed justifiable. The patient was first seen during ing the summer of 1897, at which time the physical signs were essentially those of the cases above described. A week's rest in bed caused the murmur to disappear. I saw the patient for the second time only a few days ago, at which time the same character of the pulse and arterial walls persisted, but the patient now shows evidences of a moderate

dilatation of both right and left ventricles. A distinct presystolic thrill is palpable over the region of the right ventricle as well as over the apex. A systolic pulsation over the *conus arteriosus dexter* is palpable, but the impact of the pulmonic closure is not. Auscultation revealed a murmur presystolic in time, loud, rather rough, and superficial in character. This presystolic murmur is audible not only over the left ventricle, but also over the region of the right ventricle as far as the right border of the sternum, although the point of maximum intensity is at the apex. With the unaided ear the murmur is more distinctly audible than with the stethoscope, and especially can the superficial origin of the murmur be detected when one auscultates with the unaided ear over the left border of the sternum. The patient has a thorax with a relatively large anteroposterior diameter; the sternum is prominent; and percussion shows the presence of a thin layer of lung over the entire precordial area. The murmur changes its character and intensity with the respiratory phases and is faintest when the patient sits leaning forward during forced expiration, conditions which should increase the intensity of an endocardial murmur. Sphygmographic tracings of the carotid artery show the oscillation in the wave that is characterized by Roy and Adami as the papillary muscle oscillation, which is caused by arterial resistance to the ventricular systole. High arterial resistance is certainly inconsistent with mitral stenosis, and if we have added to this the audibility of the murmur over the right ventricle as well as over the left, and the diminution of the intensity of the murmur during the expiratory phase when an endocardial murmur should increase in intensity, I believe we may safely say that the murmurs are cardiopulmonary in origin.

The Systolic Murmur.—The most common location of the systolic murmur is that portion of the precordial area which undergoes the greatest excursion, and that is over the *conus arteriosus dexter* and mesocardium of the right ven-

tricle. A systolic murmur may be heard over the apex or over the region of the right ventricle.

I will not prolong the clinical description of the systolic cardiopulmonary murmur, but will say that it may be soft and blowing, or sawing in character, having various degrees of intensity and palpability. It may be made to appear and disappear during inspiration or expiration, or on changing from an upright to a horizontal position, or *vice versa*. Sometimes the murmur can not be made to disappear under any of these conditions. Under such circumstances to differentiate from the murmur of a relative insufficiency when there are signs of myocardial insufficiency present, we are left entirely to the appreciation of the superficial origin of the murmur. Though the murmur may not be made to disappear by a change of position or by a change in the respiratory phase, if there are no evidences of a myocardial insufficiency, and no disturbance in the equilibrium of the circulation between the right and left hearts, I think we are justified in saying that the murmur is cardiopulmonary in origin.

The systolic cardiopulmonary murmur, when occurring in the immediate neighborhood of the heart, is often interpreted as interrupted or cogwheel breathing. The following case is a good instance:

Patient presenting all the physical signs of tubercular infiltration and cavity of the apex of the right lung, with a moderate infiltration of the lower portion of the upper lobe and tuberculosis of the larynx. Cardiac rate, 120; the heart slightly enlarged to the left, the pulsation of the right ventricle being distinctly palpable under the lower end of the sternum. There are no evidences of tricuspid insufficiency. There is no murmur over the left ventricle, but over the right border of the heart slightly to the right of the sternum, one hears with every cardiac systole a faint blowing sound. If the patient is instructed to take a deep breath and hold the lungs in the inspiratory phase,

along the right border of the heart with every cardiac systole a loud blowing sound is heard, which is respiratory in character, but which I regard as a cardiopulmonary murmur, although, if one were to disregard the association between the murmur and the cardiac cycle, it could be interpreted as cogwheel breathing.

Systolic Murmur.—The following instance is one of many I could describe from my clinical records:

A man, forty years old, presents no evidences of any cardiovascular disease either in the character of the pulse or in the size or activity of the left or right sides of the heart. The anteroposterior diameter of the thorax is relatively large. The sternum is prominent. There is no precordial area of absolute dullness. During the phase of inspiration one can hear a loud, rough, superficial murmur, of equal intensity, over the regions of the right and left ventricles. If the patient makes a forced expiration the murmur completely disappears, though the heart itself becomes distinctly more accessible, as is demonstrated by an increase in the precordial area of dullness.

Telesystolic Murmur.—The following case I regarded as a telesystolic cardiopulmonary murmur:

Patient, thirty years of age, complains of cardiac palpitation; has used tobacco excessively; lost much sleep, and indulged in coitus to excess. Physical examination reveals no pathologic evidences in the lungs. Precordial area of dullness begins to the right, at the left border of the sternum, and extends to the nipple-line; apex in the fifth interspace in the nipple-line. There is marked precordial activity, showing quite a marked increase in the anteroposterior diameter and a decrease in the transverse diameter of the heart with each systole. The systolic tone is loud and high-pitched. Sharply defined and confined to the apex area, one hears a short, crackling noise immediately after the systole in the upright position, and slightly later in its chronicity, when the patient is reclining. The sound comes

distinctly between the systolic and diastolic tones. The second aortic sound is loud and high-pitched. The pulse is rhythmic and regular; its volume is moderately large, with a high interruption in the catacrotus. The catacrotus is slightly prolonged.

The telesystolic murmur is rarely blowing in character, and nearly always suggests compression of a small portion of lung,emitting a sound like one due to the presence of fluid in the bronchial tract. This telesystolic murmur follows the valvular closure, but precedes the diastolic tone. I conceive the murmur to be produced in the following manner: After the closure of the atrioventricular valves the systole of the ventricle continues, producing the oscillations in the aorta and in the heart-tracings which are interpreted as records of the papillary muscle contraction and the outflow-remainder waves. During this silent portion of the ventricular systole a piece of lung is compressed between the chest wall and the ventricle, thus producing the faint superficial sound, audible over a small, sharply circumscribed area, which in my experience has always been the apex area.

The Diastolic Murmur.—Patient admitted to the City Hospital in July, 1897. At the time the patient presented only the evidences of slight myocardial insufficiency and slight edema of the ankles. The evidences of myocardial insufficiency greatly increased. The size of the heart increased very slightly to the left and to the right. After the patient had been confined to the hospital for several weeks there was audible a soft diastolic murmur as well as a systolic murmur, both sharply defined over the apex region. The auscultatory signs continued as such for several weeks. Then, in addition to the murmurs already mentioned, one could hear a soft systolic and soft diastolic murmur over the second intercostal space to the right of the sternum. The diastolic murmur accompanied the diastolic tone. During this time there had been absolutely nothing in the course of

the man's disease that would suggest an endocarditis. There were, too, absolutely no evidences in the pulse of an insufficiency of the aortic valve nor of an aortitis. The diastolic murmur grew in intensity and extent, being audible at the time of death over the aortic area, over the mesocardium, and over the apex. The patient died after an illness of three months with all the evidences of a myocardial insufficiency. The necropsy revealed not the slightest sign of an endocarditis at any point, nor were there any evidences of dilatation of the aorta or of the aortic ring.

During this patient's illness I frequently attempted to cause the murmur to disappear by changing the position of the patient and controlling the respiratory phase, but the diastolic murmur persisted under all of these conditions and forced us to make a false diagnosis, in spite of the fact that the character of the pulse strongly indicated an absence of aortitis or insufficiency of the aortic valve. There were no sounds audible over the jugular veins nor over the *bulbus venosus*. There were no evidences of the diastolic murmur possibly being venous in origin.

Telediastolic Murmur over the Pulmonary Area.—This patient was a medical student in his second year; twenty years of age, well nourished and well developed; he had had no other diseases than influenza, which occurred two or three years ago. During the past year his heart had been repeatedly examined by his fellow senior students, who were fully capable of detecting any pronounced cardiac lesions. I examined him first on November 10, 1896. During the preceding week he had had some fever and headache. He noticed that day that he was very nervous. His pulse was arhythmic; rate, 130.

Physical examination: Pulse-rate, 120. There is no intermittence, but there are frequent alterations in the rate, There is no capillary pulse; the arteries are of good size, and there is no evidence of hypoplasia of the aortic system. The brachial and femoral arteries are felt to slap under the

finger during the cardiac systole. Over the brachial and femoral arteries are heard loud, high-pitched tones during the cardiac systol. Over both right and left subclavians one feels a systolic thrill; there is no thrill in the carotids. Apex is in the nipple-line and fifth interspace; heart not enlarged to the right. Systolic murmur heard over the apex increases in intensity toward the base, but is much louder over the aortic area. The murmur is also loud over the manubrium and subclavians. The aortic second sound is loud and high-pitched; no murmur during the diastole. There is no edema and no fever. This condition of affairs persisted until the end of November, when the patient was able to go about without any inconvenience. In May, 1897, I examined him again. The arterial tone was still faintly audible and the systolic murmur over the aortic area very faint. Arhythmia follows only on exertion. I regarded his case as one of acute aortitis, without stenosis or insufficiency of the valve. I examined him a third time, February 1, 1898. The patient in the meantime had been attending to his duties as a medical student. He has noticed little difficulty, though after a full meal or severe exercise he is apt to have palpitation and arhythmia. Walking up three flights of stairs causes marked exhaustion. Mental anxiety will cause palpitation, tachycardia, and arhythmia, though there are no ineffectual heart-beats. These signs were present while demonstrating his case to his fellow-students. The tachycardia, arhythmia, and palpitation disappeared after a few moments' rest. There is now no capillary pulse. The pulse has a rapid ascent and the first portion of the catacrotus is very rapid, the remaining portion being relatively slow; no dicrotic wave is palpable. There is a moderately loud tone with the heart systole over the femoral, but not nearly so loud as during the acute stage of the disease. The heart is now about a finger's breadth external to the nipple-line, apex in the fifth interspace; the impulse is relatively broad. The right border of the heart's dullness is

at the left border of the sternum. The impulse over the *conus arteriosus dexter* is relatively strong. No closure palpable, no thrill. In the upright position there is a soft systolic murmur over the apex, which has some lung in front of it. The diastolic tone is clear. Over the aortic area there is a soft systolic murmur; the diastolic tone is clear. In the second interspace at the left border of the sternum there is a soft murmur with the systole and a fairly loud, clearly defined, superficial murmur following the diastolic tone. The character of the murmur is best appreciated by auscultating with the unaided ear. On forced expiration, the systolic murmur at the apex and the systolic and diastolic murmurs over the pulmonary area entirely disappear. In the horizontal position the systolic murmur over the apex becomes louder; the diastolic tone is clear. Over the pulmonary area the systolic and diastolic tones are both clear. The postdiastolic murmur entirely disappears, but over the aortic area there still remains a soft systolic murmur. All of these murmurs, with the exception of the soft systolic murmur over the aortic area, I regard as cardiopulmonary in origin. The aortic systolic murmur is due to a relative dilatation of the aorta accompanying his aortitis.

In conclusion, I wish to mention one misconception of the cardiopulmonary murmur that has generally prevailed since the day of Laennec—*viz.*, that the murmur is dependent upon the respiratory act. This is not true, nor is such a hypothesis necessary for an explanation of the method of production of the sounds. The sound is produced by excursion of the lung, but this excursion is entirely independent of the respiratory act. The movement of the air in the lung is produced wholly by compression or aspiration of a part of the lung caused by the change in the form of the heart during the cardiac cycle. The phenomenon is entirely indepedent of the respiratory act.

The essentials for the production of the sounds are: A certain volume of lung must be implicated. The lung

must occupy such a position relative to the heart and chest wall that the heart will have complete mastery over its excursion. The relations may be such that the rapid excursion of the lung will occur during any portion of the cardiac cycle. The duration* may be holosystolic (during the entire systole) or merosystolic (during a part of the systole). The merosystolic murmurs may be presystolic, mesosystolic, telesystolic. With reference to the diastole, the murmurs may be holodiastolic (occupying the entire diastolic phase) or merodiastolic (occupying a part of the diastolic phase). The merodiastolic murmurs may be protodiastolic, mesodiastolic, telediastolic. The murmurs produced by compression of the lung are often vibratory in character. Those produced by aspiration are always softly blowing in character.

I have been guided in my clinical study of the cases reported, and in the discussion of the subject, by the work of Potain and his pupils. It is their explanation of the physical basis of cardiopulmonary murmurs which I have adopted. I do not wish to be interpreted as classifying all so-called functional murmurs under the head of cardiopulmonary murmurs, though I have come to regard most of the so-called functional murmurs as of cardiopulmonary origin. That a murmur can be produced in the manner described there is ample clinical proof from many of the best clinical observers. The experimental evidence of François-Franc alone is enough to establish the physical truth of such murmurs.

François-Franc discovered, while operating on a dog, that there was a systolic murmur audible over the heart. Without opening the pleural cavity he introduced a tenaculum through the thoracic pleura, and withdrew a tongue of lung from the anterior aspect of the heart. Directly the murmur ceased; but the murmur returned when the tongue of lung was permitted to reoccupy its former position. It

*See Potain in *Clinique medicale de la charite*

is not always possible to demonstrate the cardiopulmonary murmur as such, when present, though it may be diagnosticated by exclusion. When a murmur is present and is not associated with any evidences of modification of the pulse wave, and when there is no enlargement of either side of the heart, or any disturbance of the circulatory equilibrium between the pulmonary and aortic circulations, I believe that we are justified in interpreting the murmur as belonging to the cardiopulmonary class.

MOVABLE KIDNEY

BY YEATMAN WARDLOW, M. D., COLUMBUS

In drawing the attention of this Society to the subject chosen for the title of my paper, I am aware that we are approaching well-trodden ground. Apparently much diversity of opinion exists, however, regarding the extent of the symptoms attributable to the condition, while no little doubt seems to prevail with reference to the employment of those procedures of radical nature which have been advocated and undertaken for its relief.

Clinical experience having convinced the writer that in the hurry and rush of a busy practice the condition is one which is frequently overlooked, it is my desire in this paper to urge upon the practician the adoption of some systematic method for detecting its presence. More especially does this seem necessary since the accompanying symptoms are often almost identical in character with those resulting from entirely dissimilar conditions, while their severity is apparently in no degree commensurate with the amount of renal displacement which may be present.

Moreover, since through the agency of modern abdominal surgery and the corroboration of diagnoses by means of exploratory incision, movable kidney has been demonstrated to be less rare than was formerly supposed, it be-

hooves us to exercise even greater diligence than heretofore for the benefit of our patients. For certain it is that the treatment of symptoms unquestionably due to the presence of misplaced renal organs has frequently been neglected, and, in too many instances, has even resulted in the sacrifice of useful and entirely innocent organs.

There is at present in my charge a young woman who has, during a period of two and a half years, been under the care of three different physicians of unquestioned ability, for symptoms which were declared by each adviser to be of gastric origin. These symptoms, which were accompanied by reflex neuroses of severe character, were traced beyond a doubt to a fall from a bicycle. Severe gastric crises and acute exacerbations were invariably produced when the patient incurred jarring motion of any kind. Medicines and diet for her "dyspepsia" had given no relief. The history of traumatic origin prompted abdominal examination, and the right kidney was found misplaced and movable to the extent of about four inches. Palliative measures for the relief of the lesion gave prompt and almost entire relief of her symptoms, and I am confident that if the patient would consent to a radical operation a permanent cure would result.

The estimated frequency of movable kidney has become greater as our knowledge of the condition has progressed. Franks has pointed out that fixation of the organ through the postmortem solidification of the perinephritic fat has frequently caused the pathologist to overlook evidences of antemortem mobility. This fact explains the statement of Loomis that he had made but one diagnosis of the condition during life which was sustained by necropsy.

Clinical statistics of different writers vary somewhat as to the frequency of the condition in the female sex, since different physical conditions and circumstances of environment naturally make some classes more liable than others. All are agreed, however, that it is at least five or six times more frequent in women than in men. In women who have

borne children the proportion is about eight or ten percent, while in those presenting themselves for gynecologic troubles it is still greater. The right kidney is affected about twelve times more frequently than the left.

Abnormal mobility of the kidney is of two kinds—congenital and acquired. The former, which is of such rarity as to possess little clinical importance, is entitled to mere passing mention. In this form, properly named "Floating Kidney," the organ is entirely surrounded by peritoneum except at the hilum, where it is reflected around the emerging structures to form a mesonephron. In such a condition the kidney floats more or less freely in the abdominal cavity, according to the length of its attachment.

The second form is of especial interest to the surgeon. In these cases the organ has by some means become loosened from its normal attachments and has become mobile within its fatty capsule behind the peritoneum.

Appreciating that in a paper of this character there is neither time nor necessity for detailed attention to the descriptive anatomy of the parts involved, I shall confine my preliminary remarks largely to those factors which, being believed to be influential in holding the kidney in its normal position, are therefore of importance in their etiologic and pathologic relations.

Anatomists assert that both kidneys are normally sitnated entirely above a line drawn around the body at the umbilicus, and are so deeply placed that they cannot be felt unless enlarged or misplaced. Experience has convinced me, however, that the latter part of this statement is not strictly true, for I have frequently been able to detect the lower extremity of the organ in patients where the clinical history and subsequent developments have demonstrated that a diagnosis of pathologic mobility was unwarranted. In these cases, however, the peculiar slipping sensation communicated to the examining fingers in the pathologic condition, is never present.

The experiments of Cunningham, who, by a process of hardening *in situ* of the viscera of cadavers, has been enabled to make exhaustive research into the question of intraabdominal pressure, have attributed to this force considerable importance as a factor in maintaining the kidney in its normal position.

Cunningham declares that the anterior surfaces of the kidneys are divided into superior and inferior plains for the reception of this intraabdominal pressure, as follows:

The superior division of the anterior surface of the left kidney receives pressure from the stomach, spleen and suprarenal capsule, which tends to force it downward and backward, while the corresponding surface of the right kidney is acted upon in the same direction by the liver. The inferior planes of both kidneys are in relation to certain portions of the intestinal canal, which, by exerting pressure in an upward and backward direction, partially counteracts the force already mentioned from above and creates a resultant force which presses the organ into the postperitoneal space in the loin, where it lies imbedded in the perinephritic fat.

The importance of this perinephritic fat as a supporting structure of the kidney has unquestionably been overrated—since nowhere in the body is such tissue of great tenacity. It is more than probable, however, that it contributes materially toward the result in an entirely different way, acting as a buffer or cushion against which the various pressures on the anterior surface of the kidney tend to drive that organ.

The connective-tissue formation, existing between the kidney and adjacent structures, combined with the actual contact of the peritoneum over a portion of its surface, are undoubtedly elements contributing to the support of the kidney, although not of sufficient strength to bear its weight unaided.

Since the results of Cunningham's experiments seem to indicate intraabdominal pressure combined with the sup-

plementary action of the peritoneum, connective-tissue attachments and perinephritic fat as the important factors maintaining the organ in normal position, evidently those conditions impairing the efficacy of any of these factors may be predisposing causes of movable kidney.

Relaxation of the abdominal walls, resulting from frequent pregnancy, habitual wearing of tight corsets, removal of large abdominal tumors, and ventral herniæ, frequently cause movable kidney by producing a decreased or negative intraabdominal pressure. Herniæ of other varieties sometimes dislocate the organ through direct traction of their contents upon it, while it seems possible that tight corsets may also contribute, by forcing the kidney upward and away from its normal relation, thus stretching its connective tissue attachment.

All diseases accompanied by malnutrition predispose to abnormal mobility of the kidney, partly by absorption of the perinephritic fat and, as I believe, more especially by producing a relaxed condition of the body tissues in general.

In two cases of young unmarried women which have come under my observation the trouble apparently had its beginning in a severe attack of chlorosis. In neither case, however, was there loss of flesh in any appreciable degree. The appearance of movable kidney as a part of Glenard's disease, in which there is prolapsus of the entire abdominal viscera, should not be forgotten.

In many cases movable kidney is of such gradual onset as to make the detection of any immediate or exciting cause difficult. In most cases accompanied by pronounced symptoms, however, a history of a fall, strain, or traumatism may often be elicited.

The symptoms of movable kidney are so many and uncertain that their description as a clinical picture is extremely difficult. As it has previously been remarked, their severity is apparently in no degree dependent upon the amount of abnormal mobility in the affected organ. In fact the man-

ifestations of the condition seem to display the most severity and greatest variety in those cases in which the displacement is to a certain extent limited and circumscribed.

Those symptoms depending upon increased tension and stretching of the nerve-fibers in the hilum and immediate vicinity of the organ are generally the first to attract the attention of the patient. Constant dull and dragging pain in the loin of the affected side causes considerable inconvenience and often severe suffering. In these cases, assuming the recumbent posture usually gives relief, though frequently the patient experiences uneasiness and pain when lying on the side opposite the affected kidney.

Reflex symptoms of great variety cause the patient intense discomfort, and occur in all forms from mere abnormal sensation to the most severe neuralgias.

Neurasthenia is almost always present in the more marked cases.

Torsion of the blood-vessels and ureter with consequent obstruction of their lumina often refers symptoms of grave character to the mobile organ itself. Interference with the blood-vessels causes symptoms depending upon the degree of resulting congestion in the kidney. Pain in the loin and urination in small quantities and of high specific gravity attend this complication, while albumin and casts are often present.

Obstruction of the ureter causes symptoms not unlike those just described. The pain, however, is generally more severe and of a colicky nature, while in the more pronounced cases, careful palpation in the lumbar region will detect the presence of the distended pelvis of the kidney. On reduction of the dislocated organ, either by manipulation or change of the patient's posture, and consequent straightening of the twisted structures, the symptoms are quickly relieved.

When marked hydronephrosis is present its liberation is marked by a sense of fulness in the bladder and sudden

desire to micturate. In these cases the danger of pyo-nephrosis should always be remembered.

Cases in which the pathologic mobility has become more pronounced are often accompanied by symptoms resulting from dragging upon the neighboring portions of the intestinal canal through their connective-tissue attachments. Such symptoms must of course vary according to the relations of the kidney which happens to be affected, while in those cases in which the connective-tissue attachments are of deficient extent or density, inconvenience from this source is comparatively slight since the organ may more easily detach itself and become more freely movable without disturbing the normal relations of the neighboring viscera.

Dislocations of the left kidney, by distorting the course of the colon at the point of its contact with that viscus, are frequently responsible for extreme constipation with accompanying symptoms which vary according to the degree of resulting obstruction.

With pathologic mobility of the right renal organ, however, these mechanical manifestations, when present, usually assume a more decided and severe character.

In these cases, resulting from disturbance of the anatomic relation of the descending portion of the duodenum, the symptoms are referred to the stomach and vary from a slight dyspepsia to suffering of the most acute and severe character.

Flatulence and nausea in the milder cases, with vomiting and periodic attacks of severe abdominal pain, and even collapse in those more pronounced, cause the patient much suffering. Such acute manifestations, although sometimes caused by intemperate diet, frequently occur without apparent cause.

General debility and malnutrition appearing as a later development may of course be the direct result of the lesion or only coordinate with it.

When the physical examination is carefully and sys-

tematically made the diagnosis of the condition is easy except in those cases in which the organ has become adherent in its abnormal position. Examination for the condition should be systematically made in all cases having abdominal symptoms of any kind.

Those conditions with which movable kidney might be confounded are not difficult to differentiate since the form of the organ can usually be made out.

Prolapsed spleen is so rare that it hardly deserves mention.

Distended gall-bladder is of more importance, but the previous history of jaundice and the comparatively limited mobility of the mass in a vertical direction will be of great aid in such cases. In a few instances the crepitus of biliary calculi may be felt. The following method of manipulation has been most satisfactory in my experience:

The patient lies on her back on a table or couch with the legs extended and the upper part of the body raised and supported at an angle of forty-five degrees. In such a posture the element of gravity is brought to the aid of the diagnostician.

Facing the patient on the side to be examined one hand is placed over the lumbar region while counter pressure is made in front immediately below the margin of the ribs. Directing the patient to take a deep breath, the offending organ may be grasped between the hands of the examiner. Pressure on the kidney is frequently productive of pain and causes it to slip from the grasp of the fingers with a snappy motion during expiration.

Palliative treatment of movable kidney cannot be said to be satisfactory. Reduction of the dislocation, however, which may usually be accomplished by manipulation of the organ for the immediate relief of such mechanical symptoms as hydronephrosis and gastric crises, almost invariably gives comfort to the patient. Abdominal support is usually attended with but little success. I have been able to

give relief, however, in six out of twenty-eight patients upon whom I have tried the method, and I therefore cannot agree with those surgeons who are disposed to entirely ignore its use. The supporter should be applied so as to give equal pressure over the whole lower abdomen with view of increasing intraabdominal pressure, since the anatomic position of the kidney must render the mechanical action of a pad useless.

Constant confinement of the patient in bed, combined with tonic treatment and nourishing diet, although theoretically correct and advised by eminent authorities, in certain cases, I have not found practical, since no patient will undergo the treatment sufficiently long to obtain the desired results.

Operative measures are usually attended with more satisfactory results. In my own limited experience, consisting of seven cases, upon which I have operated for the relief of the condition, six have experienced entire relief, while the remaining one has received material benefit.

Regarding the technic of the operation, it seems superfluous to remark that those methods which comprise the opening of the abdominal cavity are unworthy of consideration as exposing the patient to unnecessary danger, since the organ may be approached through the lumbar incision with comparative safety. The only objection which has been urged against the use of this route, that the organ is often difficult to reach through it, has little force with those operators possessing sufficient knowledge of the technic for the proper performance of the operation. Edebohl's method of utilizing the action of a roller-pad by pulling the patient downward upon it after the incision has been completed, causing the organ to appear spontaneously at the orifice of the wound, is of great use in shortening the time of operation.

Suturing the organ into its new position I regard as the important step of the operation, since its fixation at an improper elevation may cause as much trouble as the condi-

tion for which the operation is performed. I have always endeavored to fasten the kidney so that its upper extremity is just in contact, without undue pressure, with the margin of the lower rib, although its attachment to that structure I have never found to be practicable.

Stripping the capsule from the kidney and passing the anchoring suture into its parenchyma I believe to be unnecessary, since in my last three cases I have made the attachment by merely denuding and attaching by superficial sutures the capsule itself to the anterior lamella of the lumbar fascia. I believe that the diminished risk of introducing pyogenic germs into the glandular tissue of the organ in the use of this method is worthy of consideration.

Care should be taken that none of the perinephritic fat is allowed to remain between the areas over which union is desired.

DISCUSSION

Dr. J. C. Reeve, Jr., Dayton: It was a slip of the tongue, perhaps, made the writer say it was more frequent on the left than on the right side. Did he not mean the reverse?

Dr. Mary J. Finley, Mansfield: I wish to call attention to two matters. Early in my medical life a patient came to me with loose, lax abdominal walls, complaining of vague pains and a lump in her right side. Palpation was unusually easy, but I could feel no lump. She said: "Wait; put your hand there." I did; she took a short, deep inspiration, and the kidney slipped down under my fingers as clearly defined as if it lay before my eyes. I have found the same measure of use in other cases. My attention being early called to this condition of movable kidney, I have found it in a large number of women whom I have examined for other conditions. They knew nothing of it, and I was careful to leave their minds free. They had no symptoms. In four out of five of these cases the dislocation was on the right side. I have never seen it mentioned as being relatively more frequent on the right side in women than in men. I would like to know if my experience is unique. There is one reason for its greater frequency on the right side in women, which I have never seen noted; that is, the wearing of tight cloth-

ing and heavy skirts pressing on the liver and acting through that solid organ, tending to produce displacements of all the inferior abdominal viscera.

Dr. Edwin Rickets, Cincinnati: I have listened with interest to this paper. I was in hopes the doctor would lay some stress upon the difference between floating kidney and cyst of the gall-bladder. I am sure, had he time, he would have touched upon this point. In a case operated upon recently we had a floating kidney and a cystoma. The kidney was in front and we were not able to make a diagnosis of cystoma until the incision had been made. If you have a floating kidney, I do not think it cuts much figure whether it is on the right or left side. I think we should lay more stress upon the differentiation between a floating kidney and a cyst of the gall-bladder. I have seen such men as Tait make a diagnosis of floating kidney, and, upon opening the abdomen, find an ovarian tumor, and *vice versa.* The use of heavy skirts dragging on the liver above is an explanation I am very much in favor of. I think we could make more progress from a prophylactic standpoint than we do. If the ladies were so disposed, we could accomplish much more from this standpoint than by trusting to surgery after the trouble is once present. As to measures for the retention of these floating kidneys, I do not suppose we have any better man in surgery than Dr. Ben Johnson of Richmond, Va. His manner of anchoring the kidney was one of the prettiest pieces of surgery I have ever seen.

Dr. C. F. Hoover, Cleveland: I wish to call attention to one agency which assists in holding the kidney and liver in their positions in the hypochondrium, *viz.:* the elasticity of the lungs. The elasticity of the lungs is alone responsible for the negative tension in the pleural cavity, and, together with the intraabdominal pressure, (supported by the abdominal walls), serves to maintain the diaphragm in its arched position, and also serves to hold the liver and kidneys in the hypochondria.

There are few women who visit the hospital and clinic where I am engaged in whom the right kidney cannot be palpated. If not the entire kidney, the lower pole of the kidney at least can be palpated, which suffices to identify the organ. The left kidney is not so accessible and is palpable in a relatively small number of cases compared with

the right. I cannot give accurate statistics on the frequency with which the right kidney is palpable in men, but will venture to say the right kidney can be identified in its position in about 50 percent of men.

If the patient be instructed to lie on the left side with knees drawn up and abdominal walls relaxed, the right kidney will move downward and toward the median line. In this position a right kidney may be distinctly palpated; that is entirely inaccessible in the dorsal position. If you will practice the same method in palpating the left kidney (with patient lying on the right side) you will be surprised to find how often the left kidney may be palpated even in men.

Diagnosis of intraabdominal tumors or viscera by palpation is attended by many errors. But the identification of the normal kidney or a tumor of the kidney is a diagnosis that should be attended with few errors. The deep position of the kidney makes it very accessible from behind, so that bimanually the kidney can be so clearly defined and its relation to the posterior abdominal wall so clearly detected that by bimanual palpation alone one should be able to differentiate between a retrocolic tumor and a renal tumor or the normal organ; and certainly this method alone enables one to differentiate between the gall-bladder and kidney.

Pressure upon the hypochondrium is the cause of movable kidney. The class of women who tie a number of skirt-bands tightly about the hypochondrium have movable and floating kidneys most frequently. Movable kidneys in men have occurred in my own experience in shoemakers and cigarmakers, men whose occupations induce them to sit in a stooped position, thus compressing the contents of the hypochondrium so that the kidney is slipped out of its position as a pea out of its pod.

Dr. C. A. L. Reed, Cincinnati: I regret I did not hear all of Dr. Wardlow's paper. I am permitted to make only one or two observations pertaining to the question of diagnosis, for, after all, that is the important matter in these cases. I will relate an instance recently happening in my own experience. I was called by one of the ablest practicians of Cincinnati, one of the most acute diagnosticians of my acquaintance, to operate for the relief of strangulated kidney. I was advised of this fact in the message. Pain in the right hypochondrium and a tumor developed within the

past twenty-four hours, which could be palpated. The contour was the contour of the kidney. Pain was in the direction of the ureter. There was no difficulty with any other function. We made an anterior exploratory incision and found, firmly adherent to the kidney, a distended gall-bladder, from which I removed two calculi. It is necessary to remember that the gall-bladder may be prolapsed until it occupies the entire anterior side of the kidney. It is not always easy to designate what may be the origin of that lump.

The question of etiology is one that bears a very close relation to the general welfare, yet it must be left largely speculative. I am reminded of recent proceedings in the Academy of Medicine of Cincinnati. Dr. Bettman made considerable research and succeeded in establishing the important fact that there is a general relationship between the character of displacement of the kidney and other intraabdominal organs; therefore, it would seem that the cause producing this particular trouble is to be found to a certain degree, in a general constitutional state, to those conditions which tend to a general relaxation of the suspensory organs. It is well to direct attention to this particular feature.

I wish to congratulate you, Mr. President, and the Society, upon this very acceptable contribution of the essayist.

Dr. C. L. Bonifield, Cincinnati: Two very competent surgeons thought they felt one of these kidneys so plainly that they operated for it and removed a distended gall-bladder with gall-stones.

Dr. H. A. Hare, Philadelphia, Pa.: The one thing that has struck me forcibly is that floating kidney seems to be more frequent in Ohio than in Pennsylvania. I have a large dispensary and wards under my care, and floating kidney is not a condition we frequently meet with. I should say if I saw one or two in the course of a year I was meeting my average number of cases.

A point is to be made in the diagnosis which, I think, is of value; namely, the position of the hand of the examiner on the flank of the patient on deep inspiration. I have found this a most valuable sign. In some cases there is usually very little difficulty in making a diagnosis. The physician should grasp the side moderately tightly (not very tight), and tell the patient to take a long breath. You can then feel the kidney slip down between the thumb and forefinger. On

expiration, the kidney slips back. It is to me the most valuable sign I have been able to employ.

I am somewhat surprised at the ease with which one of the gentlemen thinks he can palpate a kidney when it is or is not dislocated. He says that in 50 percent of men you can feel the normal kidney on the right side. My experience is that 75 percent of men have such well-developed muscles and ribs it is almost impossible to palpate this organ with satisfaction.

Dr. Wardlow, in conclusion: I think if I had been allowed to finish my paper, I would have brought out a number of points that are important. I have mentioned that a great number of kidneys are palpable; can be palpated, especially on the right side. The point of differential diagnosis lies in the fact that the kidney is not so movable. There is a peculiar sensation which the movable kidney gives to the touch of the fingers. In diagnosis I have been in the habit of aiding myself by calling on the force of gravity. I make the patient assume a posture at an angle of 45 degrees with the surface of the earth. It relaxes the abdominal wall and gives me a better chance. The symptoms present in these cases are not always in proportion to the trouble. As to differentiation, I think it is hardly necessary to touch on the subject of distended gall-bladder. Where a mistake is made in that way, I think it is due to carelessness. Such a mistake may be made in a strong man with thick abdominal walls, but in a thin woman where we generally have movable kidney, the mobility of the kidney is not the same in any respect as it would be in a distended gall-bladder. Besides, there would be the previous history of repeated attacks of jaundice. The position of the tumor is different, and when the walls are thin, you can sometimes feel the stones in the gall-bladder. I have never been able to do that myself. In acute attacks, we all know we can manipulate the kidney and restore it to its normal position.

I want to say a word about bandages. I have had fair success with the bandage. I have been able to use it mostly in women with lax abdominal walls. I have used it in about twenty-eight cases, in about half with decided benefit, and in about six with almost complete relief. I think it is worthy a trial. The kind I use is adjusted so as merely to create a positive intraabdominal pressure. If we should be

able to make direct pressure upon the kidney, it would cause more disturbance.

In operative procedures I have not had so much experience; seven cases altogether. In one case I had an almost absolute failure. The other cases I think I can say are practically cured. I think no surgeon of experience would advocate the method of going through the abdominal cavity when we can get at it in the other way, and without entering the peritoneal cavity. For me, I prefer the incision in the back. My method has been simply to make the lumbar incision. I try to remove as much postperitoneal fat as possible and then stitch the organ in position. I denude the surface with a pair of gynecologic scissors, instead of splitting and turning back the kidney capsule, and avoid passing the anchoring sutures into the parenchyma of the organ, if I can possibly do so.

URIC ACID

BY D. N KINSMAN, M. D, COLUMBUS

Uric acid was discovered by Scheele in 1776. It exists in human urine, either free or combined. It appears in the herbivora, when they are in a state of inanition and are autophagic. Its place, when they are fully fed, is supplied by hippuric acid. In dogs kyonuric acid fulfills its function. It is the larger part of the urine of birds and reptiles, and is excreted by insects.

Roberts says: "Its presence in human urine is anomalous. As a vehicle for the excretion of nitrogen it is not needed. Its place is taken by urea, which by its easy solubility is better adapted to the liquid urine of mammals. Perhaps uric acid is a vestigial remnant of mammalian descent."

When pure it is transparent and its crystals are many-shaped. In the urine the crystals are always colored a yellowish hue. It is sometimes deposited in the decomposition of urine when it is allowed to stand for twenty-four hours, and the addition of a small quantity of hydrochloric acid

will cause precipitation, but the failure to precipitate in either case does not exclude its presence. It is very difficult to recover the whole of the uric acid from any specimen of urine, as the many processes devised for this purpose testify. It is dibasic and unites with alkalis to form acid and neutral salts.

Uric acid is found in the blood, muscles and glands, especially in the thymus, liver and spleen. It is formed in the liver by synthesis of ammonia and lactic acid (Minkowski). The spleen also shares in its production. Garrod thinks uric acid is formed synthetically in the kidneys. He is the chief advocate of this view. Uric acid and urea are the end-products of nitrogenous metabolism. In man 90 parts escape in the form of urea and 10 parts as uric acid, in round numbers.

Virchow long ago observed that uric acid was increased in leukemia. Pettenkofer and Voit found, when healthy persons were fed on exactly the same food as leukemics, the uric acid excreted was 64 percent greater in the latter.

Horbaczewski has sustained the view that uric acid is produced by the destruction of the leucocytes, from its presence in the spleen and in leukemia.

Uric acid is increased in anemia, because the blood-cells no longer convey sufficient oxygen for the respiratory demands of the body.

In cyanosis carbon dioxid diminishes the energy of the cells; uric acid appears. And in cases of renal impermeability, owing to failure of the oxygen to be furnished in sufficient quantity, uric acid appears in excess. Free acid in the urine leads to the separation of uric acid in the kidneys and obstruction of the passage of the urine through the ureters may lead to decomposition of urine and the deposit of uric acid.

Uric acid, then, is derived from the metabolism of albuminoids in the body. Its quantity bears a definite relation to the respiratory function. The albuminoid reduction

passes through the chemical forms, kreatin, kreatinin and the uric-acid series. This last series is:

Hypoxanthin,
Xanthin,
Uric acid.

There is no proof that uric acid is the precursor of urea.

By others uric acid is believed to owe its origin to the nuclein of the cells, and yet others think it is a product of arrested oxidation in the liver, because it is formed therein and because it can be reduced to urea. The experiment of Minkowski, while proving that the major part of the uric acid is formed in the liver, proved that it was still formed in small quantities after its removal. Glycogen and urea by synthesis form uric acid. Uric acid is soluble in 15,000 parts of cold and 1,900 parts of hot water. Its ratio to the urea varies within wide limits, *i. e.*, from 1:10 to 1:300. Its usual proportion, or rather its normal ratio, is 1:30 or 1:45.

Bouchard has shown that uric acid *per se* is not toxic when injected to the amount of 9.6 grains per kilogram of rabbit. The quantity of water, 122 c. c., with soda necessary for its solution when injected, is as fatal as the combination. How it can cause so many distressing phenomena when it accumulates in the human body in much smaller proportions it is not easy to understand.

The quantity of uric acid in the urine is no index of the amount in the blood, when the total of the urine is less than 30 ounces daily (Harley).

Since uric-acid formation is controlled by so many conditions, both internal and external, most of which are disturbances of physiologic processes, it becomes a question whether the uric-acid diathesis in its various manifestations is due to the acid itself, or to conditions of the organism preceding or accompanying its formation.

There are other members of the uric-acid series which accompany its formation which are violent poisons. There is paraxanthin, which produces tetanus of the muscles,

dyspnea, and dilatation of the lungs; heteroxanthin, which produces paralysis of respiration, diminished reflexes and tetanic contraction of the muscles. Hypoxanthin increases reflex excitability and causes convulsions, and when injected subcutaneously, increase of uric acid. Xanthin causes muscular rigor, paralysis of the spinal cord, and the heart muscle is affected also (Vaughn and Novy). The relations of all these substances has not been worked out. Although by oxidation uric acid may be formed from some of them, it is evident they cannot produce all the uric acid.

The conditions which are included in the term uric-acid diathesis are very complex, and uric acid seems to be rather an index of changes going on in the body in which the attendant products are more important than itself. The condition is made up of autointoxications, not by one, but many agents.

Garrod has shown that free uric acid exists in the blood-serum in gout. Usually it exists therein in the form of urates. Haig (Uric Acid in the Causation of Diseases, 1897,) as the result of fourteen years study, is of the opinion that the daily production of the uric acid in the body varies within very narrow limits. The quantity in the body at any time depends upon its retention or its ingestion when the ratio rises above 1:30. The following table of the amounts of uric acid, from chemical analysis given by Haig, shows the amount of uric acid introduced with each pound of food given:

	grains.		grains.
Lamb, cold roast	3.5	Veal cutlet	3.5
Soup from bones	0.48	Beef, cold sirloin	1.1
Soup from meat	1.4	Sheep's kidney	3.5
Hospital beef tea	7.	Liver	6.5
Saddle of mutton	1.4	Fowl breast	1.7
Rabbit	1.0	Mutton, cold roast leg	1.1
Mackerel	2.2	Beef-steak, raw	1.3
Mackerel boiled ¼ hour	1.0	Meat juice	49.7
Mackerel, plain	0.2	Meat extract	63.0
Herring fish	0.2	Tea	175.0
" Kippered	6.0	Coffee	70.
" Bloater	2.2	Cocoa	59.

Lib—*op. cit* 609 *et seq.*

These estimates are rather below than above the true amount. A study of the list will especially interest tea and coffee-drinkers who suffer from lithemia. A better clinical knowledge of the urine is needed. Our work has been limited to testing for sugar and albumin, while uric acid and urea, etc., are neglected, we thus deprive ourselves of very valuable data for diagnosis, and fail to seize upon important indications for treatment.

You will pardon me for introducing the following case history as an illustration of what I mean:

On January 7, 1898, I was visited by Mrs. S., mother of five children, born at short intervals. Her father is living at 76, a victim of diabetes for many years. Mother living and healthy. For years she has been suffering from recurrent attacks of abdominal pains, which would come on at irregular intervals. They spread over the whole abdomen and were rarely accompanied by vomiting or diarrhea. These attacks would last for some hours at first, but lately they have become more frequent and of longer duration. She had spent some years in Denver, where the attacks continued. She mentioned an interesting fact, that during her pregnancies she was absolutely free from these troubles. No plan of treatment hitherto adopted had been of more than temporary benefit.

From the absence of these attacks during pregnancy I was inclined to think that they were due to some uterine irritation, which was quiescent during pregnancy. An examination disclosed a small rent in the *cervix uteri*, which, however, was not sensitive. There was no evidence elicited of biliary or urinary calculi, or anything else to account for the attacks. My first examination was absolutely negative in results. I requested a specimen of her urine, which was placed in my possession the following day. There was a specific gravity of 1.034, acid, no sugar, albumin, blood or casts, and on standing and when treated with hydrochloric acid no uric acid was deposited.

On January 20, 1898, I was summoned to her bedside. A suspicion had arisen in my mind that the attack might be "Dietls' Crises," due to a misplaced kidney. The kidneys were not mobile; the left was vaguely tender. My second examination of the patient was as barren as my first. As she was then just recovering from an attack, I asked if the recently discharged urine had been saved. In the commode I found about eight ounces of urine, and in the bottom thereof not less than a teaspoonful of uric-acid crystals. The cat was out of the bag at last, and the diagnosis seemed reasonably clear. She was ordered to drink a quart of Vichy water daily, eat green vegetables, white meats, and drink milk. The result: no attack since. The uric-acid crystals have not reappeared and the woman considers herself well, and I believe she will so continue while she feeds upon the prescribed diet.

We can understand why the attacks were not present during pregnancy. It has long been known that gouty women were free from its attacks during pregnancy. The changed conditions of nutrition are usually followed by completer oxidation of the products of nitrogenous metabolism and the uric acid is no longer retained. The occurrence of this intense lithemia in the daughter of a diabetic father suggests a possible hereditary tendency to glycosuria, which may appear later in life unless this diathesis is controlled hereafter in this patient. The pain, in my opinion, was due to these recurring attacks of gravel, and it was diffused over the abdominal viscera. She told me doubtfully that she thought she had had more pain usually on the right side until recently, when it had been more diffused.

We learn that uric-acid accumulations in the blood lead to feelings of fatigue and mental depression so prolonged and severe as to cause attempts at self-destruction. The daily excretion of urea fluctuates considerably. The normal excretion of urea is placed at 3.5 grains per pound of body weight. The excretion of uric acid usually maintains a

ratio of 1:33 to urea. In a man of 160 pounds weight it is from 12 to 15 grains daily. Its rate of excretion depends upon the alkalinity of the blood. Any factor which reduces its alkalinity reduces the output of uric acid.

I think the following facts may be regarded as proven in respect to uric acid. It may be retained in the body either as uric acid or as urates. According to Bouchard, it is not a poison, and when retained in the body its effects are mechanical. It may exist free in the blood-serum (Garrod) or be precipitated about the joints as urate of soda, or in other organs, or after a more or less prolonged retention it may be discharged in lithic-acid storms through the kidneys. Its retention in the body is marked by a diminution of the urine and increase of vascular tension. Its discharge is accompanied by increase of urine and decline of vascular tension. The amount of uric acid which may be present in the body depends upon the aliments which are ingested, the integrity of digestion excretion, exercise, etc. Heredity plays an important part in the production of the uric-acid diathesis. All persons having a hereditary or an acquired uric-acid diathesis are in a state of unstable equilibrium, and circumstances determine whether the outcome shall be lithemia, gout, migraine, fibrosis or some other dystrophy. The relations of migraine, epilepsy and asthma have long been recognized. The clue which joined them has not been very clear. Instability of the nervous cells has been invoked, and "discharging lesions" thereof when force has been stored therein; increased size of the arterial trunks which supply the brain, and stomach disorders have figured as causes, and anatomic modifications of the cerebral cells have been, at least in epilespy and migraine, regarded as efficient factors. That indigestion and the putrifying contents of the intestines have an incidental relation to epilepsy and migraine has been known, and it has been the custom of the profession to advise light suppers of milk and bread, because it has been learned that such a regimen was influential in warding off nocturnal seizures.

The explanation of this fact seems to me to rest upon the prevention of the accumulation of the uric acid and its congeners, which is always greatest in the morning hours, coincident with most of the nocturnal epileptic seizures. A diet containing a minimum of this acid withholds from the blood that which is furnished in large quantity by a meat diet, *i. e.*, uric acid, potash, and products which arise from bacterial action in the intestines; in a word, it limits auto-intoxication.

Rachford, after prolonged and careful study of cases of migraine and epilepsy, has concluded that paraxanthin, which is a member of the uric-acid series, has a distinct causal relation to these diseases. This substance, which exists in small quantities in the urine, when applied to the muscle causes tetanus, paresis and finally its death.

The writer has inherited migraine, which has been hereditary in five generations, and with it other gouty manifestations in the enlarged metarsophalangeal articulations of the great toes; urinary calculi, and frequent uratic deposits in the urine. On a few occasions swelling and extreme pain in the great toe-joints have been suffered, as well as lithic-acid storms; respiratory distress, which on fast walking is a precursor of the headaches, subsides after the attacks. The same is true of one of my children.

The migrainic attacks in my case have always been marked by diminished urine, great vascular tension, and pallor of the skin. The temporal arteries always feel hard and of apparently larger caliber. As the attack declines the quantity of urine increases and often lets fall deposits of uric acid. This case has been a model in my examination of other cases, and in a great number I have found there was the same train of symptoms. In the light of Haig's researches, it is possible my migraine is due to uric acid and its congeners, which accumulate from time to time in my body. Confirming this belief is the fact that after these storms no amount of exposure, no indiscretion in diet, loss

of sleep or fatigue, which are very potent in causing the headache at other times, cause it for some time thereafter, until uric acid has again accumulated.

Lithemia, diagnosticated by the presence of large quantities of uric acid or urates voided in the urine, is another manifestation of the uric-acid diathesis. In addition to the symptoms narrated in the case above, it causes vertigo, slow pulse, which often intermits, and vascular tension. The patient is irritable, moody, hypochondriacal and hysterical. They have a great variety of digestive disturbances, disordered vision and flying pains in the limbs and about the joints.

Whether the digestive troubles are a cause or consequence is immaterial. They may be either, or both, the patient being in a vicious circle of nutritional disturbances. Imperfect digestion and dilatation of the stomach are associated with large uratic discharges in the urine. Dilatation of the stomach is much more common than we have hitherto suspected. Bouchard, Autointoxications, p. 178, *et seq.*, Ed. 1887, makes the following very suggestive statements: "Let us now record the modifications of the general nutrition in persons whose stomach is dilated. A great number of organs suffer. It is not surprising, therefore, that we observe loss of strength, diminution of physical and moral energy, emaciation in the advanced stages, but frequently a flaccid obesity with pallor, abundant deposits of urates in the urine. Augmentation of its acidity and the appearance of the red-wine color on the addition of perchlorid of iron." * * *

"Finally, I ought to call your attention to the existence of modifications of the osseous tissue in the vicinity of the articulations. They are formed by the enlargement of the base of the second phalanx. In some rare cases two nodules are noticed laterally on the anterior surface of the base of the phalanx, as we see Heberden's rheumatismal nodosities on the base of the third phalanges. Sometimes all the fingers of both hands present these nodules. * * *

"In some persons there are pains in the deformed joints In some their articulations are deformed, those of the thumb and wrist more rarely. Of all cases of dilatation of the stomach, out of 100, 25 had these deformed articulations, and in men alone they existed in 32 out of 100. Bouchard concludes: "These nodosities are not due to rheumatism; that when they exist, dilatation of the stomach always exists." They, we conclude, are features of the uric-acid diathesis, caused by reducing the alkalinity of the blood; in consequence of the effects on the alkalinity of the blood the acid is produced in the dilated stomach. They are dystrophies caused by uric acid. They improve as the stomach troubles improve, and grow worse as it grows worse. Rheumatism affects the larger joints by preference, gout the smaller. Gouty invasion of the joints of the hand is in the reverse order of that of rheumatism.

Bouchard's nodosities and Heberden's nodes do more than suggest the possibility of a relationship. They stamp the diseases in which they occur as one. Interstitial nephritis and gouty kidney are used as synonyms. It is a disease of late life. Its symptoms are abundant urine, increased vascular tension, left cardiac hypertrophy, and a small amount of albumin, which is often absent for long periods. The urea which is discharged is normal in amount, but from the first the uric acid is diminished and its daily excretion in many cases is not more than from 1-10 to 1-4 its normal amount. I presume this impermeability of the kidney might be recognized by chemical analysis of the urine before any other symptoms are present. Vascular tension leads to a thickening of the vessel-walls, hypertrophy of the heart, atheroma of the arteries, hemorrhages into the brain and stomach. Epistaxis is frequent, which has been thought by many to be the precursor of uremia in interstitial nephritis.

Uric acid causes cutaneous eruptions, tonsillitis, pharyngitis, bronchitis, asthma, or aggravates them. It retards

the healing of wounds, builds stone in the bladder and infarctions in the kidneys. It causes a world of distress, and then has gout to fall back upon as its masterpiece.

Because uric acid falls in a test-tube in a colloid form when in contact with alkaline phosphates, Haig infers that this may occur in the blood-vessels, and that this colloid form of uric acid plugs the capillaries and increases vascular tension. It does more; it is the cause of Raynaud's disease, by blocking the capillaries.

These conclusions are not warranted, in my opinion. Because the phosphates precipitate uric acid in a colloid form in a test-tube, we cannot, therefore, assume that this process occurs in the small blood-vessels. Vascular tension, it seems to me, is due to nervous action and not to embolism by uric acid. Nor does it seem possible that the blood could so soon dissolve these colloid deposits of uric acid, when lying in the distal capillaries. There are evidences that other products, which are present in the uric-acid diathesis and which are potent to disturb the harmonious action of the nervous system, as indicated above, are influential through the nervous system. Haig has done a valuable work, but I do not think all his conclusions are warranted.

Diagnosis

This rests upon urinary analysis in which the ratio of urea and uric acid is determined for days. The thread experiment of Garrod, while it shows the presence of uric acid in the blood-serum, is not peculiar to gout. Cabot says, uric acid is to be found in the blood in pneumonia, cirrhotic liver, nephritis, anemia, leukemia and gravel, and after a meal of calf's thymus, or any food containing much nuclein (Cabot, Examination of the Blood, page 275). But I do not see how this statement vitiates the general conclusions to be drawn from the test. It only shows the wider extent of the uric-acid diathesis than Garrod thought. Neusser says basophilic granules surround the nuclei in the mononuclear and polymorphonuclear leucocytes in cases in which

there is uric acid in the blood. We rarely see the tophaceous deposits in the joints in America which show gout, but we do see a good many cases of uric-acid disease, and it is quite necessary that we should be able to recognize them.

When this has been done, the treatment is obvious. Haig relies on sodium salicylate more than any other remedy. Lately Bohland has criticised this treatment, alleging that it increases leucocytosis and thus uric acid at the same time, and renders the patients more liable to joint affections. Aside from the use of colchicum, there is nothing better than the alkaline waters for the treatment of uric-acid affections. Colchicum acts as a cholagogue and clears uric acid from the liver, or possibly the constituent parts before their synthesis.

Beyond this, the food is the most important consideration. Meats, soups, glands which contain large amounts of uric acid, should be used sparingly or not at all. Carbohydrates and vegetable albuminoid substances, with no alcoholics should constitute the diet. Exercise, frequent and prolonged, as well as methodical, should be prescribed.

DISCUSSION

Dr. J. B. May, New Holland: This is a question of broad interest in which we are all so much concerned that I think we ought not let it pass without discussion. It is above criticism and a valuable paper.

Dr. D. S. Hanson, Cleveland: There is something back of the formation of uric acid, certainly not well understood. Something circulates in the blood, causing destruction of tissue and the deposit of uric acid. It is a peculiar feature that uric acid should be deposited when the blood contains properties more than sufficient to dissolve all the uric acid present. Why this is so, we do not understand. There are many diseases where there are no gouty manifestations and yet uric acid is present in large quantities.

Dr. Kinsman, closing: I am sorry to have read the Society down and sorry I could not get through. I want

you though, to carry this way. Uric acid is an unknown pathogenic quantity; that with its production there are congeners that can account for these symptoms more rationally than the uric acid itself. In all doubtful cases, the urine ought to be very distinctly and positively studied. The case alluded to was under observation for eight years and I was in as much doubt as anybody until I saw that urine. It was a gouty manifestation. The patient has had no attack since. If you get in the habit of studying uric acid, it will give you the earliest means of recognizing that your patient is in the early stage of kidney disease. A prolonged study will point that out. Another point: the microscope has brought before us a study of the leucocytes, and will put us on the track of the early development of changes in the connective system, in the kidneys, and elsewhere, which so far as medicine is concerned, have been rebellious to treatment. If we can get rid of uric-acid accumulations, as I believe we can, there is a great deal to be gained by following out dietetic method. I am not a convert to all that has been written on this subject, but it is brimful of suggestions.

THE OBSCURE CASES OF GALL-BLADDER DISEASE

BY EDWARD S. STEVENS, M. D., LEBANON

The enemy in ambush is the enemy to be feared. The unseen danger is the grave danger. Can we but know what emergencies to expect with certain conditions we may prepare to meet them. Among the diseases with which the physician and surgeon find themselves called upon to cope and which have these characteristics of uncertainty, are those of the gall-bladder with symptoms so obscure that their recognition is long a matter of great doubt, and the treatment of which, consequently, is equally unsatisfactory to physician and patient.

It is not a difficult matter to make a diagnosis of gall-stone colic when pain in the proper locality is so severe and cutting that the subject doubles himself into a bow-knot, or

gets down upon the floor and claws at the carpet; nor is it to be wondered at if one with little experience in medicine quickly arrives at the conclusion that there is an obstruction to the proper flow of bile if there is extreme jaundice, stools the color of blue clay or putty, and very dark urine.

But these decided symptoms occur in the exceptional cases. The great majority of cases of gall-bladder disease are not recognized from such signs; many are not recognized at all, and the question is continually asked "what is the matter with the American stomach?" when there is nothing at all, primarily, the matter with the poor old American stomach, and our offices are flooded with literature and samples of various digestive ferments warranted to cure just these very troubles that do not yield to the remedies when employed, for the salivary glands, the stomach, and the pancreas have already supplied all that is necessary in that line.

One instinctively feels that those cases of disease accompanied by such severe symptoms as colic and cholemia are the graver cases. Yet when one thinks of it these are but the symptoms which show us that Nature is making an effort to free the delicately made gall-bladder of an incubus of perhaps many years standing, and that by a natural channel. They are grave cases, yet, perhaps, after a little period of anxiety the stone may pass, the symptoms disappear, and possibly the disease be at an end.

What of the case before such symptoms come on? Is there not much more reason for anxiety when we consider our uncertainty as to the exact condition present, and whether, if there be calculi present, they may not ulcerate into the pelvis of the kidney, the portal vein, the peritoneal cavity, or be found in an abscess of the liver—and that without giving rise to notable symptoms until the mischief is accomplished. And all of these conditions, and others, have been found after a variable history of mild gall-bladder disease

In many of these cases we can in the first place merely be suspicious of the existence of gall-bladder disease. When one applies for relief from trouble with the stomach and gives a history of having applied for relief in vain to many well-qualified physicians we may suspect that there is some condition present apart from the stomach. If the supposed signs of indigestion are independent of the taking of food into the stomach our suspicion is strengthened. But this is not sufficient to establish a diagnosis of gall-bladder disease. The suspicion of it being aroused, months may elapse before anything is noticed more than simple distress in the stomach with eructations of gas. Stones may be present and yet cause no pain, or catarrh of the gall-bladder of low grade may exist without either pain, tenderness on pressure or a perceptible tumor being noticed. If one does not hastily jump at a conclusion he will sooner or later discover other signs of the suspected trouble. There may be a slight sallowness of the skin. If it is from bile there will be a reaction in the urine upon making the proper test, although the colors may be quite faint. There may be periodical passages from the bowels of strings of mucus—occasionally of blood also.

Just as certain mental emotions may cause at times the involuntary evacuation of the rectum or urinary bladder so they may give rise to an effort on the part of the gall-bladder to expel its contents. This may be more or less painful, or perhaps produce symptoms of distress so slight that it is not considered important enough to refer to a physician. I have seen this slight distress follow worry over business affairs and a law-suit. In one such case the diagnosis was confirmed by the passage of a calculus from the bowels after a sharp attack of hepatic colic. In a second case prolonged and severe distress was caused by deep grief over the death of a child at one time, and at other times excitement produced a like effect. In another case hypochondriac distress was subsequent to a prolonged fit of laughter.

The diagnosis, strengthened by other signs, was confirmed in this case by cholecystotomy.

Among the most interesting symptoms dependent upon the existence of gall-bladder disease with which I have met are certain reflex symptoms. In considering them one should bear in mind the extensive distribution of the branches of the pneumogastric nerve and the sympathetic. Among the most common of the reflex disturbances is palpitation of the heart. Another, which I have twice observed, is pain in the urinary bladder.

The following references to disturbances of the respiratory apparatus seem to me to be of some interest. I have never seen any mention of similar symptoms being apparently caused by irritation from biliary calculi or other disease of the gall-bladder.

I. A lady sixty-six years of age applied to me for relief from pulmonary disease. There is a history of consumption in the family. She complains of shortness of breath, severe cough, and profuse expectoration. There is a history of "liver and stomach trouble" extending over a period of thirty years. She speaks of a constriction about her body as if by a cord. Her pulmonary disease engaged my attention and seemed sufficient to account for all of her symptoms. Some months after taking charge of her case my attention was directed to a tumor in the right side which seemed to me to be a distended gall-bladder, and not long afterward other signs of obstruction were noticed—light-colored stools, dark-colored urine containing bile, and slight jaundice. It was from this time on that the patient and her family, as well as the physician, noticed that the distress in breathing always came on, and her cough was always more severe when the gall-bladder became distended, or when there was pain or distress in the epigastrium or right hypochondrium.

II. A lady about forty years of age seemed to have obstinate laryngeal trouble. She was subject to violent

spasmodic coughing spells, frequently followed by aphonia. Examination of the larynx revealed nothing to account for these symptoms or for the great pain she experienced in her neck. Occasionally one or more of the cervical muscles would cramp, producing great pain. She complained of pain under the ribs on the right side. A guarded diagnosis was made of gall-bladder disease, probably due to gall-stones, and other signs were looked for. She had what seemed to be neuralgic pains in the chest and neck, and an intermitting fever, the fever always preceded by a chill and coming on at the same hour daily. These were at first accounted for by the fact that she had been living in a malarial district. Very slight jaundice was observed several times, and repeated examinations of the urine gave at times the reaction for bile and at times none. Operation was advised and accepted. A few days previous to the operation she experienced one of her spasmodic coughing attacks. This was relieved by full doses of morphin hypodermatically. A slight cough persisted until the day of the operation and was accompanied by aphonia. A large number of small calculi were removed from the gall-bladder. When consciousness was restored the lady's voice was clear and her cough was gone.

In a large number of the obscure cases of gall-bladder disease there will always be more or less doubt as to whether the gall-bladder and ducts are diseased at all. Moreover, with a reasonable degree of certainty as to the location of the disease, there will always be more or less doubt as to the character of the disease, for, be it remembered, there are other forms of disease which produce gall-bladder disturbance besides gall-stones and the inflammatory affections. In such cases, the symptoms not yielding to treatment, and being essentially chronic, it is eminently proper to advise an exploratory operation for the purpose of making certain the diagnosis. This may be advised in the first place because in the hands of one who is skilled in this

work the danger is almost *nil.* In the second place the propriety of such advice may not be questioned because the exploration is the first step to be taken in a radical gall-bladder operation, and most of the chronic gall-bladder diseases require local treatment rather than medicinal if a permanent cure is to be effected. Even though an incurable—a malignant disease—be discovered upon opening the abdomen, it is a matter of great satisfaction to know positively what condition is present—what not to treat. It has happened, too, in numbers of cases that relief followed the simple exploration, although the abdomen was closed with the knowledge that malignant disease of or near the gall-bladder was responsible for the symptoms for which relief was sought.

DISCUSSION

Dr. Edwin Ricketts, Cincinnati: I am glad the Doctor has called our attention to things that often happen in connection with gall-bladder trouble. In a case seen a short time since, the pain was referable to the left side, and when the attack of gall-stone colic made its appearance, there was pain in the left arm-pit, extending to the fingers in that arm. In another case, pain was referred to the left side. No distension of the gall-bladder could be made out, although calculi weighing twenty-eight grains were found present A case suffering since last November came under observation a few days ago. No history of the passage of gall-stones, no gall-stone colic, but a peculiar dead pain and loss of flesh. There was a strange condition found. The bladder was flexed anteriorly and bound down. A quantity of gritty substance was removed from the bladder. No morphin was given afterwards. Bowels moved very freely within eight or ten hours after the operation. No medicine was necessary. Has since gained quite a number of pounds in flesh.

Our attention has been called very markedly in the last few years to appendicitis. The next organ that may receive attention will be the gall-bladder and the diseases thereabouts. Many cases of so-called indigestion and neuralgia

of the stomach will be traced to the gall-bladder. On exploration, a stone weighing one hundred and twenty-eight grains was removed from the gall-bladder of a patient who had never had gall-stone colic. All symptoms disappeared.

Dr. R. B. Hall, Cincinnati: I predict that in the near future the statement made by the last speaker will be proven true. The next organ to be investigated surgically will be the gall-bladder. In fact, not a few surgeons are doing it now. The question of exploratory operation in suspected disease of the gall-ducts is an important one. It brings the responsibility of advising a serious operation. If we take a little time and observe carefully the clinical history, an operation will rarely be advised unless there is disease present. I believe in a number of these cases we will make an exploratory incision for diagnostic purposes and close the incision after a completed operation. I have had patients whose symptoms justified an exploration. I made the exploration and relieved the patient. In a few cases I found the disease to be cancer and beyond relief, but the exploration settled the question of diagnosis beyond the possibility of a doubt.

Time will not permit me to go into detail as to which case should, and which should not be operated on, but I want to emphasize this, when you feel an exploration is justifiable, then advise it and make it.

Dr. Stevens, closing: I do not know that I have much to add. When asked to prepare a paper, there came to my mind numbers of cases that had seemed to be cases of indigestion. After having been unsuccessfully treated in many places, some of them came to me and it seemed to me that there was something more than simply indigestion. I am speaking of the obscure cases. Any of us will make a diagnosis quickly when we have jaundice, or pain in the region of the liver. In an obscure case there may be simply eructation of gas. They are given bismuth and it relieves for a while. If we watch carefully we will find that there is a more serious condition present, but that it is not at a serious stage. I have been unfortunate enough to lose by death a number of persons, friends, who have had this mild trouble. Some refused operation when it was advised.

How do we know these cases are cases of gall-bladder

disease at all? There are four ways that have been useful to me. First, the mild disease becomes, after a while, the severe disease. The second is after death—a postmortem examination. This is an undesirable method of making a diagnosis. The third, having made a diagnosis, you watch for the gall-stones and they pass by the bowels. The fourth is cholecystotomy. In some cases of disease there are calculi present, but there are many in which there are no gall-stones, but there are other conditions. When there are no stones present; drainage of the gall-bladder will often give immense relief to the continued suffering of the patient. It has been said of the simple catarrhal cases that we can cure them with phosphate of sodium but, somehow, they do not get well. Robson, in the Hunterian lectures of last year, in speaking of these simple catarrhal cases of gall-bladder disease says that after a reasonable, and not too long a period of treatment by medicines it is proper to drain the gall-bladder. He also says that the surgeon who will let his patient with a distended gall-bladder live on without an operation is permitting him to live in a fool's paradise.

A CASE OF CIRRHOSIS OF THE LIVER

BY P. J. KLINE, M. D., PORTSMOUTH

F. M. B——, age 48 years, coal dealer, of good family history and temperate habits, called at my office for what he supposed to be a bilious attack. He was well-nourished. Although scarcely six feet tall he weighed a little over two hundred pounds; his tongue was covered with a heavy coat of a brown color; the organ was broad and flabby, showing on its edges the indentations of the teeth; stomach was dilated; walls to all appearance thickened. In short the whole abdominal cavity was very much enlarged and the amount of adipose tissue deposited in the walls was so great that it was impossible to determine with any degree of exactness the lower border of the liver; the upper line of the liver was readily defined and very deep palpation over the abdomen indicated some enlargement of this organ. There was mark-

ed tenderness just below the ensiform cavity and resistance at this point greater than normal. He was able to lie on either side without inconvenience. Palpation in the lower part of the abdomen gave a slight thrill as though there was some accumulation of fluid in the abdominal cavity at this time, but the extreme thickness of the walls prevented its being clearly made out at that examination. Subsequent events proved this surmise to have been correct.

He was ordered mild chlorid and sodium bicarbonate in small doses to be taken for ten or twelve hours and then carried out with a saline. This was followed with a mineral acid and pepsin. His improvement was both marked and sudden, and he then passed from observation for the next eight months, when we were called to attend him at his home for what proved a long and remarkable course of illness. The change at this time in the patient was startling, his skin was of a dirty ash color; lips and fingers cyanotic; breathing hurried and oppressed; blood-vessels over the surface of the abdomen stood out in bold relief; the abdomen was enormously distended with ascitic fluid. Diaphragm and liver were pressed up to such an extent that both respiration and the heart's action were seriously interfered with. An aspirating needle was introduced and two and one-half gallons of fluid were withdrawn from the abdominal cavity. Relief of all the distressing symptoms was immediate and marked. The fluid was of an orange color; alkalin in reaction, slightly albuminous; specific gravity of 1.012 and weight eight pounds to the gallon. This process of tapping was repeated every second day for a number of times, resulting in two gallons at each operation, showing that the accumulation was at the rate of one gallon in every twenty-four hours. After the sixth aspiration it settled down to a steady accumulation, requiring an operation for the patient's comfort on each fourth day—for the next five months—when suddenly there was a cessation of

hosilities and there was no marked accumulation of fluid for seven months.

During this time the general health of the patient improved, his color became better; he ate and slept well and it for a time at least seemed as though there would be a permanent improvement, although there was but very little or no gain in bodily weight. There was something interfering with assimilation. A physical exploration made just after the first aspiration, together with ascitic fluid, showed that we had a case of "cirrhosis of the liver" to deal with. While some writers speak of rare instances in which recovery takes place, we found this to be only a lull in the conflict, for at the end of this time the ascitic fluid again accumulated, requiring aspiration for both the safety and relief of the patient every fourth day up to within about one month of his death. The whole time covered by this case from the time we were first consulted until the end came was three years and eight months; in all likelihood his entire ailment would safely be put down at four years, for he had been feeling badly for some time before his first call. In this time the total number of aspirations was two hundred. Whole amount of fluid withdrawn, four hundred gallons, entire weight 3400 pounds—over one and a half tons of fluid. All these operations were performed under simple but strict aseptic plans. The surface of the abdomen at the point where the needle was to be introduced was first carefully washed with boiled water, followed by a rubbing with alcohol at each sitting. The same care was exercised in rendering the aspirating needle clean by the use of water at the boiling point. Absolute cleanliness was the only means used to prevent infection, of which there never was a symptom during the entire two hundred operations, and all of them were performed within a field of operation that could have been covered with a silver dime. The reason of this was that we found that cicatricial tissue was less sensitive to the entrance of the needle than tissue that never had been penetrated. He also took during the

same time one thousand hypodermic injections of morphin in an area of less than two square inches without a sign of inflammation. The same precautions were observed as in the tapping. These hypodermics were rendered necessary on account of the pain he suffered in the region of the liver after contraction set in. The remedies used in the main were hypophosphites of soda and strychnin, together with mineral acids and the infusion of digitalis, occasionally, as needed, the sulfate of magnesia, and at times the mild chlorid of mercury.

During the first year his diet was very carefully regulated, but as it seemed to result in little or no improvement to the patient he was allowed to eat about what he chose. His appetite during most of the time was fairly good; about the only inconvenience he suffered was that when he overloaded his stomach, the contents were ejected in an entirely acid state. His mental faculties were clear up to within a short time of his death; his strength was good so that he could during all this time attend to his business affairs.

Three times at least before the end came he was for two or three days entirely unconcious and had all the symptoms of uremic coma. At these times his breathing would be short; his pupils contracted and insensible; cornea insensible to external irritants. Urine scanty and slightly albuminous; bowels sluggish. No tendency to convulsions. At these times the most and speediest relief was obtained by the use of the mild chlorid of mercury, salines and the free exhibition of the infusion of digitalis.

These attacks we do not believe depended so much on a condition of albuminuria as upon foreign substances in the blood which had not been eliminated by the liver, now much lessened in its physiologic action as a result of the chronic state of interstitial hepatitis.

DISCUSSION

Dr. D. N. Kinsman, Columbus: Mr. Chairman: I do not like to be the monitor of this Section all the time, but

it does seem to me there was something in the paper that should be discussed. Doctor, was the patient jaundiced?

Dr. Kline: No, sir; not marked.

Dr. Kinsman: Did you make a postmortem?

Dr. Kline: No, sir.

Dr. Kinsman: Well, of course, the postmortem is very important in these cases. The case is anomalous in many respects. We have all seen cases with an accumulation of water in the abdomen, with all the symptoms the Doctor has spoken of, and after tapping continued until the collateral circulation has opened up, the dropsy would disappear. Did he have the *caput Medusae?*

Dr. Kline: No, sir, but the vessels were enlarged over the abdomen.

Dr. Kinsman: When that occurs, the dropsy subsides. That often deceives us, because we see the dropsy disappear after tapping and we think the case is recovering. The patient does not accumlate flesh but walks around with a big belly, like a watermelon on pipestems. If the collateral circulation was once opened up freely, it seems to me strange that the dropsy should again occur. The cirrhosis can contract so there is no transmission of fluid through the liver at all, particularly in severe cases of cirrhosis. The Doctor's case is not the most wonderful one of tapping, but it is the most wonderful one of hypodermic injections. Those of you who have read Thomas Watson's Practice, remember a tablet erected to a dame who in the course of her life had been tapped to the extent of thirteen hogsheads for ovarian dropsy. Whether the man, in the case reported to the Society by Dr. Kline, was a syphilitic or a drinking man or had anything that would lead to the formation of scar-tissue is not in evidence. The Doctor says he had a good family history and that his habits were good. There seems to be something hereditary about this at times, and in other cases there does not. I have seen these cases, and I have got so I don't know what under the heavens to do for

them. I was very much in the shape of the men Niemeyer describes, who treated tubercular meningitis. He says formerly physicians had no trouble treating these cases; they did all they could and the patient died. The end seems to be death; it don't make any difference whether it starts in the spinal cord, as it does in tabetic cases, or in the liver or the lung. We have no means of arresting the cirrhotic process. I have sometimes thought bichlorid of mercury given for a long time has postponed the fatal end, but the end has always been death, for fortunately or unfortunately I have outlived the patients and I know they have all died. I have never known a patient to get well from any of these conditions.

Dr. Kline, in closing: Many things in the case I would like to have brought out but I tried to keep my paper within the ten-minutes' limit. The history of the case was very thoroughly gone into when I first saw the patient, having known him for a great number of years. We can exclude entirely any syphilitic taint and alcohol. As far as the postmortem was concerned, the patient and I had all our arrangements made. In fact, the patient had requested me to make a postmortem, but out of deference to his friends that was let go by. But outside of a postmortem, the case was as clearly one of atrophic cirrhosis of the liver as it could be. I refer to it as atrophic to distinguish it from hypertrophic cirrhosis. The patient's ability to get about was remarkable. In the evening I would go and draw out perhaps 20 pounds of fluid and then the next day the patient would be about. He died from exhaustion in a state of coma. A great many of the hypodermics I did not give myself but I instructed his wife to use the hypodermic syringe with a gold needle and told her how to keep the needle clean and to dissolve the tablets in water that had been boiled. No trouble was caused by the numerous punctures he received. I am sorry I cannot offer you anything new. In fact, I presented the case so that if any of you had anything new for us to do for the patients in these extreme cases, you might give it and we would be very glad to receive it.

THE CLINICAL IMPORTANCE OF THE POSITION OF THE STOMACH

BY HENRY WALD BETTMANN, M. D., CINCINNATI

The position of the abdominal viscera has been the source of much discussion in recent years. Careful observation has revealed the fact that some of the most important organs within the abdominal cavity are subject to pathologic displacements to a degree little suspected a generation ago. Movable kidney, instead of being considered a rarity, is now known to be an exceedingly common condition, especially in the female. Descent of the intestines *in toto*, as a condition to be dealt with from a clinical standpoint is a revelation of the past fifteen years. Prolapse of the stomach, or more concisely expressed "gastroptosis," is a very modern concept indeed. The fact of prolapse is clearly demonstrated and acknowledged on all sides. The significance of prolapse is far from being understood. There are writers who attach immense importance to the downward displacement of the abdominal viscera, and find in that pathologic condition the root of many of the nervous and dyspeptic troubles to which women are liable. Glenard thought he had found the anatomic basis of neurasthenia and other neuroses in descent of the intestines which he called enteroptosis. Meinert thought that gastroptosis was an invariable antecedent of chlorosis, and that chlorosis was a neurosis of which prolapse of the stomach was the indirect cause. On the other hand there are writers who attach little or no importance to the position of the stomach, the intestines and the kidneys.

Inglis of Detroit has recently stated that it makes little difference if the pylorus point east, west, north or south, or whether the folds of intestine lie high or low within the abdominal cavity. The attitude of the general practician to the question is one of indifference; and a careful investi-

gation of the position of the abdominal viscera has not become a routine procedure, even in the treatment of abdominal diseases.

That the subject is one of great importance no one who has given the matter any thought can deny. That it is a peculiarly difficult field of investigation everyone who has entered upon it will readily admit.

During the past few years I have devoted considerable time in the postmortem room and in the clinic to the position of the abdominal viscera, and beg the privilege of presenting some of the conclusions reached. And first, in regard to the intestines, especially the colon. The transverse colon played an important rôle in the pathogenesis of enteroptosis as outlined by Glenard. According to him, the overloaded colon drags on its peritoneal supports; the hepatic flexure is the first part to descend; this drags on the omentum and secondarily the stomach and the right kidney become displaced. Now, in the postmortem room it is impossible to form a clear idea of the significance of the position of the colon. The position of the intestines as pictured in the text-books is rarely encountered in the necropsy-room. The colon is subject to the greatest variations. The transverse colon is rarely quite transverse; often it is looped in capricious fashion, the turn of the loop running down toward the pelvis or up over the stomach or liver. Sometimes the colon is distended, filling a large part of the upper portion of the abdominal cavity; sometimes it is partly contracted, partly dilated. The cecum occasionally is found high in the abdomen; the sigmoid flexure sometimes is found in the median line or on the right side.

It is even more difficult to draw conclusions from the position of the small intestines. In a small proportion of cases the whole mass of intestines is unmistakably displaced downwards (a true condition of enteroptosis), but in the vast majority of instances it is impossible to say whether the small intestines lie normally or abnormally. The kidneys

also present great difficulties to postmortem investigation. Occasionally their movability or prolapse is evident even to careless observation; but, as a rule, the exact position of the kidneys in the mass of retroperitoneal fat and their movability are hard to determine with accuracy and certainty.

The stomach on the other hand is more accessible to accurate investigation; and we can ascertain at the necropsy just how the stomach lay intravitam, and what relation it bore to other viscera. I have studied the normal position of the stomach in many cases in the following manner. As soon after death as possible I made an esophagotomy and introduced a stomach-tube through the esophagus into the stomach, which was then filled with 1½ to 2 quarts of water. The tube was then clamped and the abdominal cavity opened. The cardiac orific is invariably fixed on the body of the tenth dorsal vertebra somewhat to the left of the median line. The fundus rises usually to the level of the sixth rib in the left anterior axillary line, often as high as the fifth rib, lying in some instances behind the apex of the heart. The pylorus in the male lies just to the right of the parasternal line on a level with the first lumbar vertebra, or somewhat lower. The pylorus is always movable. The lesser curvature is completely covered by the liver. So much for the normal position as found in the children of both sexes, and as a rule in the adult male. In the adult female this position is met with in only a small minority of cases. In most adult women the pylorus has become movable to the extent of one to three inches so that it can easily be drawn below the free margin of the liver. Owing to this displacement downwards and to the left of the pylorus the stomach in women assumes a more vertical position than in the healthy male and the lesser curvature instead of being entirely covered by the liver may come to lie in direct apposition to the anterior abdominal wall. In other words, in the large majority of all adult females, the stomach is prolapsed. Prolapse of the stomach also occurs in a certain proportion of

adult males, but the number is scarcely ten percent of all males afflicted with dyspeptic troubles. This descent of the stomach in the abdominal cavity causes the greater curvature of the stomach, especially of the pyloric half, to lie much lower than normal, and in many cases it reaches far below the umbilicus. This fact has been one of the most fruitful sources of error in the field of digestive disorders. The literature of the past fifteen years teems with references to dilatation of the stomach and atonic distention of the stomach, and a host of physicians under the guidance of Bouchard have raised mountains of theory on the assumption of an autointoxication of the system through the retention of food in dilated stomachs. Perhaps it is a bold statement, but idiopathic dilatation of the stomach is probably a mythical disease. In certain exceedingly rare instances acute dilatation of the stomach occurs in the course of other diseases, as I attempted to prove in an article published more than a year ago in the *Lancet-Clinic*. Aside from these cases, dilatation of the stomach in the adult without obstruction at the pylorus rarely or never occurs. Bouchard based his diagnosis of dilatation on a succussion-splash obtained below the umbilicus. Nothing could be more fallacious. It is evident from what has been stated above that when the stomach is prolapsed a succussion-splash may often be elicited low in the abdomen. No method which takes only the greater curvature into account can be considered a reliable method of diagnosticating dilatation. The differentiation between prolapse and dilatation can be made only by locating the position of the lesser curvature. I shall not enter upon the various methods of mapping out the lesser curvature. The only reliable means at our command are first the distention of the stomach with air or carbon dioxid and subsequent percussion, and second the transillumination of tne stomach by means of the gastrodiaphane.

When these methods are applied to the living the same results are obtained as from postmortem study. Prolapse

of the stomach can be demonstrated in the great majority of adult women.

Extreme dilatation of the stomach artificially produced with carbon dioxid will usually reveal to the eye the course of the lesser curvature running below the free margin of the liver. The large majority of men have stomachs normally placed. Men of the phthisical habitus, men the subject of long-standing emphysema and others with narrow chest and long waists often present the condition of gastroptosis. In other men it is exceptional.

It is not the purpose of the present paper to discuss the causes which produce this abnormality in the female sex. There is no doubt that corsets and skirts fastened about the waist play the chief rôle in its production. We are confronted by the undeniable fact that in the majority of women a demonstrable prolapse of the stomach does occur, accompanied, in a fair proportion of cases by prolapse of the right kidney. It is our task to determine whether this abnormality produces symptoms or not, and, if so, what symptoms. The problem is an exceedingly intricate one to solve. There is no doubt at all that a large number of women, though their stomachs are prolapsed, enjoy perfect health. It is likewise true that many women suffer for a time with symptoms which might be referred to gastroptosis and later recover entirely from the symptoms, though their stomachs remain in their abnormal positions. It is notorious that the very aged rarely have symptoms which could be ascribed to malpositions of the abdominal viscera, although, in the aged, ptosis of the viscera is very common. It would be very crude reasoning to infer from the above that ptosis of the stomach and of the other abdominal viscera is a perfectly harmless condition. A sleepy individual is oblivious of sights and sounds which would excite him if wide awake. A person of strong nerves is not affected by irritating stimuli which would completely exhaust a neurasthenic or neurotic one.

Now it is well known by those who have studied the question before us that the symptoms of gastroptosis lie largely in the domain of nervous dyspepsia; that they affect with predilection the neurotic and those of weak nerves; that these symptoms are apt to begin at a time when the patient for one reason or another is subjected to nerve-strain. The symptoms of nervous dyspepsia are too well known to need a lengthy description here. The patients usually complain of weight in the epigastrium following the ingestion of food; of bloating and belching. Often the epigastric distress becomes unendurable, occurring at night and disturbing the sleep. A dragging sensation in the back is common. The appetite is usually good but some loss in weight follows the self-imposed restricted diet. The bowels are usually constipated, the tongue clear or only slightly affected. This stage of nervous dyspepsia often lasts for years; sometimes it progresses into marked neurasthenia. This advance is accompanied by increase in the extent of the visceral ptosis, and often a state is reached in which the patients become pronounced invalids, and in which the stomach, intestines and one or both kidneys are markedly prolapsed. The great clinical significance of prolapse of the stomach is this: that in those otherwise predisposed it leads to distinct nervous symptoms of a dyspeptic nature, which in turn react upon the general nutrition and the condition of the nervous system. Marked prolapse of the stomach undoubtedly gives rise in some cases to various forms of visceral neuralgia and sensations of a dragging nature; and this constantly-acting irritation may lead in neurotic individuals to profound hypochondria. Meinert thought that the solar plexus was dragged upon by the prolapsed stomach; that thereby its fibers which supply the spleen and control the formation of hemoglobin were deranged, and that in this manner prolapse of the stomach was a predisposing cause of chlorosis. This theory, though plausible if not carried to extremes, is unfortunately incapable of scientific demonstration.

Although this paper, by its title is limited to prolapse of the stomach, it is impossible to discuss gastroptosis without relation to ptosis of the other viscera. One-seventh to one-eighth of all dyspeptic women have a movable right kidney, and, in a certain number of these, some prolapse of the intestines (however vague the term) does occur. Now, the derangement of visceral sensation produced by descent of the stomach is undoubtedly augmented in many instances by symptoms referable directly to the right kidney and the bowels. It is impossible to dogmatize on the subject one way or another in the present imperfect state of our knowledge. It seems certain that many symptoms of nervous dyspepsia and of obscure abdominal neuralgia cannot be treated successfully until their origin in displacement of one or more of the abdominal viscera is recognized. The intensely practical part of this subject is that which relates to treatment and here as in every other case the physician must individualize.

I could cite numerous cases of nervous dyspepsia, accompanied by gastroptosis, which have been greatly benefited by the use of an abdominal bandage; and still an abdominal bandage is indicated in comparatively a small proportion of cases. Those persons in whom the symptoms due to gastroptosis have supervened upon psychic or emotional strains are usually more benefited by general systemic and tonic treatment than by local measures. In the hypochondriac it is better to divert the mind from the abdomen than to direct attention to it. The prolapse itself is very rarely curable. All we can hope to accomplish is to overcome the resulting symptoms, and, as a rule this is best done by building up the general health. The dyspepsia often calls for special treatment. In such cases a chemic examination after a test-breakfast is often necessary to guide us successfully to a correct diet. Usually hyperchlorhydria is present in marked cases; often, however, the gastric se-

cretions are normal and sometimes the secretion is greatly reduced.

Especially in advanced cases of general enteroptosis is an understanding of the underlying anatomic conditions of great value in treatment. Many chronic invalids can be practically cured by overcoming the constant dragging by the viscera on their supporting ligaments. Glenard has advised for pronounced cases an abdominal bandage, laxatives, alkalis and a meat diet, and these directions rationally carried out are of immense benefit in many cases. After some of the symptoms have been relieved gymnastic exercises intended to strengthen the whole system and especially the abdominal muscles may be of value. Each patient must be treated on lines determined by a study of the patient himself. The present paper was intended simply to call attention to the fact of gastroptosis as an underlying condition in many otherwise obscure cases and to warn the profession against the indiscriminate diagnosis of dilatation in cases of simple prolapse of the stomach.

DISCUSSION

Dr. James U. Barnhill, Columbus: This is a practical and valuable paper worthy of study and I would like for my own part to hear some discussion of it. The paper reviews the subject from a clinical stand-point in a very instructive manner. The distension of the stomach with gas is a valuable means of establishing a differential diagnosis between dilatation of the stomach and a distended stomach. I have depended to some extent upon the observation that a dilated stomach is usually outlined on the abdominal walls. In all cases this objective evidence is not manifest. I believe that this condition is of some diagnostic value, particularly in persons with thin abdominal parietes, in whom the stomach may be readily outlined on the abdomen. On inspection a line will be found above and a depression beneath. This is especially true in men. As examiners upon pension boards, we have frequently to pass upon cases of dilatation, distension or dislocation of the stomach, and the point I have referred to, has come to be relied upon by me in diagnosis. I

should like to inquire whether the essayist places much reliance on this outlining of the stomach on the abdominal wall so that it is evident on inspection. A point of much interest which was only incidentally referred to in the paper is that of the cause of the displacements downward of the stomach in females. The essayist referred to the dress and corset. I think it is well that recognition is made of this fact by medical men. It should not be condoned, ignored or denied, as has been the fashion too often in the past, as if it were of slight significance. I think the laity in general including the most intelligent women, recognize this, and med cal literature lately has been aiding in promoting this new gospel of health. The cause is largely that recited in the paper, the pressure of the corset and the weight of skirts. In our universities and colleges the lady-students have almost entirely abandoned the corset. I have been told that this is true here in the State University. When reform starts with this class, it will become popular and eventually revolutionize the manner of dress. Suspending the skirts about the waist, by their very weight, it seems to me, produces this displacement of the stomach and other abdominal viscera. The wearing of a belt is perhaps equally injurious to health.

Dr. M. E. Blackburn, Columbus: I would just like to say that an eminent Russian physician, whose name I do not remember, but who read a paper on this subject at the recent conference at Moscow, touched upon the subject of wearing corsets. His decision was that the corset was much less injurious than the belt, distributing the pressure more evenly. He cited the wearing of leather belts by men as being very harmful and likely to bring about the displacement we have heard of today. So it appears, if we are to have a constriction of some kind about the waist to support the skirts, the corset is better than the belt.

Dr. D. N. Kinsman, Columbus: I want to testify to my great indebtedness to Dr. Bettman in the past months for the articles he has written on this subject. He and Stengel and Hemmeter have been doing pioneer work along this line in this country, which is of great interest to us.

Dr. Henry W. Bettmann, Cincinnati, in closing: I regret exceedingly that the paper did not elicit a more general

discussion, for it contained a great many statements not yet accepted by the profession and which are largely individual opinions. The corset is, I think, no longer a subject of dispute in the medical mind. Our duty is to force the truth about it upon the lay mind. There is no longer a question as to whether the corset should be displaced by a belt or by suspending the skirts from the shoulders. The Doctor has correctly said that the belt is as injurious as the corset, if not more so. If you compress the waist, you displace the abdominal viscera. Men with long narrow chests have a tendency to acquire prolapse of the abdominal viscera. Chronic pleurisy and emphysema have the same effect. Whatever shoves the liver down, displaces the pyloric part of the stomach.

Regarding outlining the stomach by sight through the abdominal wall, caution must be used in making conclusions from what we see. The stomachs of one-third to one-half of all women can be more or less distinctly mapped out after a full meal without further distension. In most of these cases the stomach is not dilated but merely prolapsed. We must further distinguish between dilated stomachs and large stomachs. A great many people naturally have or acquire large stomachs. If you examine many stomachs in the postmortem room you will find a certain number of them are very large, though they cannot be considered dilated. The clinical differentiation is to be made by testing the physiologic activity of the stomach in question. The dilated stomach does not empty itself with normal promptness. We cannot be too conservative in diagnosticating dilatation of the stomach. My own opinion is that idiopathic dilatation of the stomach is a condition of extreme rarity.

CHAPTER VI

NEUROLOGY

PSYCHIC TREATMENT OF DISEASE

BY PHILIP ZENNER, A. M., M. D., CINCINNATI

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The treatment to be considered in this paper is the oldest, the most universally applicable, I sometimes think the most neglected, and certainly the most important, of all modes of treatment of disease. It is embraced in part in what is usually spoken of as moral treatment. It should be included in "psychotherapy." For the purposes of this paper I have termed it "psychic treatment of disease."

According to Strümpell, one-half of all cases of impaired health are of mental origin. The mind also plays a very important part in the cure of disease. The knowledge or the influence of psychic processes on health and disease is, therefore, of the highest consequence to the physician. That the mind directly affects bodily functions is well known. The blush of shame, the pallor of fear, the bounding heart of joyful excitement, the arrested breathing of fright, the vomiting or diarrhea from mental impressions, the changed character of the mother's milk from depressing emotions, the loss of appetite and weight from sorrow and grief, the plethysmographic demonstration of alterations in the peripheral circulation from any mental impression, and a thousand other similar illustrations are too familiar to need special mention. I wish now to dwell on mental states that are important factors in the production and cure of disease.

The mental states most injurious to health are the painful and depressing emotions, care, worry, sorrow, grief, anxiety, fright, terror, anger, rage, disappointment, etc. There is scarcely a limit to their disastrous effects. Most commonly they produce mental disease or some other disorder of the nervous system, chiefly hysteria and neurasthenia. Organic nervous disease is not rarely brought on in the same manner, and any organ, especially if it has some inherent weakness, may thus become disordered in its functions or the seat of organic disease. And not only this, but the same mental states may influence the various infectious diseases, as well as the course of surgical diseases and the results of surgical operations. For we are beginning to learn that microbes, the source of infection, gain access into the human organism with more or less readiness according as the general health is deteriorated or otherwise. The depressing emotions, causing impaired nutrition and lessened vitality, lessen the defensive power of the human economy, and favor the invasion of pathogenic germs.

Unfortunately, the physician cannot, at will, remove these depressing emotions, or ward off the serious or grave disease that may ensue. And yet something we may be able to do. The mere making a full confidant of the physician, the giving, as it were, an external discharge to the emotional states in this way, will often give some relief to the sufferer, while kindly advice soothes or makes him bear his trouble more easily. In one instance the word of the physician may be everything in preventing or curing disease; that is, where the worry or fear or dread is about one's own health, and, at the same time, in part, or altogether, unfounded. Such cases are, unfortunately, common, and years of suffering or final grave disease may ensue, which a word spoken in time might have averted.

The second great source of disease of mental origin is in the intellect. Ideas or mental representations cause manifestations of disease almost as frequently as the emo-

tions; and such diseases may be very persistent, though they have not the grave character of those brought on by the powerful depressing emotions.

A knowledge of bodily disorder resulting from the mind dwelling upon bodily functions belongs even to ancient medicine. That feeling one's own pulse may cause it to become rapid or irregular, that the sight of tremor may produce tremor, that the idea of paralysis may lead to loss of power, or the idea of having spinal disease bring on pains, or other symptoms which in the patient's mind are associated with that disease, and the more common picture of hypochondriasis, with its abdominal and other symptoms, and increase of symptoms from the patient's constant self-observation and worrying, are instances of this kind which have long been known. But how frequently symptoms are caused in this way we have only come to know in very recent years. We owe that knowledge largely to Charcot's careful studies of hysteria. I believe it is a prevalent view in the profession today that the symptoms of hysteria are to a great extent of mental origin—that is, the effect of mental representations. But this is not true of hysteria alone. It is true, also, though to a much less extent, of other functional, and even of organic diseases. That is, some of the symptoms of the latter may be produced by mere ideas, a fact proven by the ready removal of these symptoms. Such influence of mental representations is spoken of as suggestion, or autosuggestion, and, we may add, subconscious suggestion. The manner in which such ideas may be presented to the patient's mind is manifold. Most commonly it is through seeing the manifestations of disease in others, or reading about them, or hearing them spoken of. Our daily papers are in this way breeding-houses of no small magnitude, especially through their quack advertisements. What physician does not see patients in whom a thousand symptoms have developed with untold suffering, as the result of reading advertisements of

the dire effects of old self-abuse, symptoms which his assurances of unfounded fears will succeed in removing to the largest extent.

The unfortunate custom, so common among the laity, of discussing ceaselessly sickness and sick people, is another fertile source of suggestive disease. Nor is the medical profession altogether innocent. Careless words often do great harm in this direction. Of some special modes in which they suggest disease I will speak further on.

I mentioned above subconscious suggestion, by which is meant the suggestion of disease where the idea does not come into the clear light of consciousness. Subconscious mental activity is not unfamiliar to you. Let me give a few examples. While the mind is deeply engrossed one is asked and answers a question, and a short time afterwards remembers neither question nor answer. Again, one tries in vain to remember a name, and it comes to him suddenly after the matter was apparently dismissed from his mind. Or one works over the solution of a problem, lays it aside unsolved, and awakes in the morning with the solution clearly worked out in his mind. It is very probable that subconscious cerebration acts in a like manner in the suggestion of disease. The suggestion, though received by the conscious mind, may have been forgotten and yet continue its blighting action on a subconscious stratum of mind, the more damaging because nothing is known of its presence. Or even the suggestion may have been received originally in a subconscious manner. Of that I shall take occasion to speak again.

We must now speak of the influence of the mind in curing disease. The painful emotions, so baneful to health, have a very limited influence as curative agents. Fright has sometimes caused the disappearance of hysteric symptoms, aphonia, paralysis, etc., and is said to have cured attacks of gout and rheumatism. The pleasurable emotions, joy, etc., which very rarely cause impairment of health, are powerful influences in the removal of disease. Joy is the

great tonic of the nervous system. It usually increases the appetite, makes the thoughts flow more easily, and favors all the bodily functions. Where we have it at our command we have one of the most valuable therapeutic agents. Mental absorption may cause entire unconsciousness of pain, either bodily or mental, and thereby have a direct curative influence. In this way business occupation or any absorbing intellectual work or pastime may prove to be a valuable therapeutic measure.

Another great mental factor in removing disease is the appropriate mental representation, what we have spoken of as suggestion. If the idea of being paralyzed has made the patient powerless, the idea of being cured may cause the disappearance of the paralysis, or the idea that he will be cured cause its gradual disappearance. The same may occur in other diseases or symptoms brought on, mainly, in a suggestive manner. But it is highly probable that the idea, or suggestion, can do more than this; that through its inhibiting power it may assist in curing symptoms not of purely mental origin. What a power suggestion is in the cure of disease we have learned especially since hypnotism and its effects have been carefully studied. We have come to know that the magnet, and measures whose wonderful therapeutic action we could not understand, produce their results in this manner. I think, if we carefully studied our cases, we would observe that many effects that we attributed to the direct influence of remedial agents were really due to mental impressions. Indeed, it is now recognized by the best men in the profession that the good effects of all our therapeutic measures may be, to some extent, due to their influence upon the mind. This is true of drugs, of electricity, massage, baths, health-resorts, etc., and even of surgical operations in many instances.

Though the great influence of mind in the cause and cure of disease has only been fully recognized in recent years, psychotherapy has always been practiced. It is

probable that this was the only treatment in the earliest periods, as it is the chief treatment among savage people today. It has been the means of the marvel-cures of all ages. Even today the same agency works cures in sacred shrines, at the hands of heralded healers and the like, or with appliances like the "electropoise," the iron-ring cure for rheumatism, etc., which have gained for themselves great reputations, and can have no physiologic action. A thousand systems, or schools, quacks, nostrums, etc., have succeeded in the same way. They awake great expectations, inspire faith, work marvelous cures, and have their popularity of a day. Then their fraudulent claims are detected, they lose popular confidence, can work no more cures, and their day is over. The physician, too, either consciously or unconsciously, is influencing the course of diseases by the mental impressions produced. But often he is not aware of the power he is wielding for good or ill, and does not gain from psychotherapy what the legitimate claims of his profession and duty to his patient really demand. His attention has not been sufficiently drawn to the great importance of psychotherapy, either by his teachers or the medical literature. The only systematic work upon this subject, so far as I know, is Lowenfeld's "*Lehrbuch der gesammten Psycho-therapie*," an able and conservative work well worthy of careful study.

I wish in the following to speak briefly of methods of application of psychic treatment.

At the first appearance of a patient we find a great therapeutic measure in our hands in the mode of his examination. A thorough examination is often of the highest value. It gives the patient confidence that the physician fully understands his case and has the ability to manage it, and, if the appropriate assurances are given, that he will get well. It is often striking what a marked effect such an examination produces. Very often I have seen a marvelous improvement at the time of the second visit of a

patient; and over and over again have physicians, who had brought patients in consultation, assured me that the disease had almost disappeared before any suggested remedies could be administered, such was the influence of the mere examination. It is true that these are usually cases of neurasthenia or the like, but it would be a great mistake to suppose that other diseases cannot be influenced in this manner. To some extent the principle is probably everywhere applicable in practice. The physician should always bear in mind this powerful means of treatment. Often, it is true, his press of duties is so great, or the account the patient gives of his illness is so prolix, that it is impossible for the physician to listen to the whole story; but he may, at least, give a thorough physical examination, which often takes comparatively little time, and may have the moral effect desired.

Now and then a thorough examination does harm instead of good. It frightens the patient by the suggestion of new diseases, or of the special gravity of his case. The result of the examination is distress to the patient; to the physician, very likely, the loss of a case. But by a little tact trouble may be avoided. Prior study of the case may tell whether it belongs to this category, and then a word in advance that it is the physician's custom to make a thorough examination, and that the indications in his case are favorable, will very likely prevent ill effects. It is not only on such occasions that the physician must be guarded to avoid injuring the patient by his examinations—that is, by the mental effects produced thereby. Examining a special organ[1] as the heart, very frequently, or delaying the expression of an opinion while awaiting further developments, often causes great alarm. The physician should attempt to ward off such ill effects, especially as it is often true that

1 It is doubtful whether any examination is so frequently harmful as the gynecologic examination of young girls. Even in married women gynecologic examination and treatment not rarely cause symptoms in the way of suggestion.

there is nothing alarming in the condition of the patient, the only trouble being the doubt in his own mind.

I fear we often do not attempt to allay unnecessary fears in patients' minds as much as we should, especially where they are reticent, and do not tell us freely of their anxiety. Many of you will remember that scene in "The Mill on the Floss" where Tom's wound has been dressed by the surgeon, who tells him nothing of what may be the subsequent effects of the injury:

"Then his friend Philip says to his teacher: 'I beg your pardon, sir, but does Mr. Asken say Tulliver will be lame?'

" 'Oh, no; oh, no,' said Mr. Stilling, 'not permanently, only for a little while.'

" 'Did he tell Tulliver so, sir, do you think?'

" 'No, nothing was said to him on the subject.'

" 'Then may I go and tell him, sir?'

" '. . . . Mr. Asken says you'll soon be all right again, Tulliver, did you know?'

". . . . Tom looked up with that momentary stopping of the breath which comes with a sudden joy."

So well did that wonderful observer and reader of human nature, George Eliot, recognize the natural fears of impaired health, and the frequent forgetfulness thereof on the part of the busy practician.

Perhaps I dwell the more upon this because on more than one occasion I have myself been so much chagrined to learn that a patient had been in great mental distress, which a word of mine might have prevented. Nor is this always a trivial matter, or only a question of more or less mental suffering, but we often fail to cure our patient altogether until we have learned of all his anxiety and fears and succeeded in removing them.

The diagnosis and prognosis given to the patient is a very important part of psychic treatment. No remedy has a better influence than the assurance of a curable disease

and a speedy recovery. The joy resulting from such assurance—providing there had been doubt, and fear, and trembling—will alone make a marvelous change in the condition of the patient and often lead to a speedy cure.

What is the duty of the physician to his patient when the outlook is unfavorable? The practice of unhesitatingly giving the patient a bad diagnosis and prognosis is, in my opinion, exceedingly reprehensible, and this for many reasons. Firstly, it is often an act of greatest cruelty. To be robbed in a moment of all hope, or to see death staring one in the face, is exceedingly terrifying to most individuals, a state of mind scarcely appreciated by him who coldly pronounces doom. And it is not only the suffering that is to be feared, but direct injury to health caused by this mental blow. How often have I seen the profound gloom of melancholia, or shocking acts of suicide, resulting from the tidings of having incurable disease. And, furthermore, it is not rare that this suffering, or danger, was needless; that a fatal prognosis was given without reason. Diagnosis is proverbially difficult, and errors in diagnosis common. He only has made no mistakes who has had no experience. A few days ago a lady laughingly told me that twenty-five years previously her husband and herself had been informed that they had fatal diseases, and had but a short time to live, and this by a physician of national reputation. They are both in fair health today. This is a jest to the lady now, but it was almost a tragedy then. And such instances are so common that every physician is acquainted with a smaller or larger number. The patient should always be given the benefit of the knowledge of manifold, and, I may say, necessary, error. It is true, there are times when the patient should be told the truth, and again there are some who can bear that knowledge better than others. But we must not allow ourselves to be misled by the statement of the patient that he wants to know the truth. Very often that statement only means he wants you to say he has no

grave disease, while the truth is in reality more than he can bear. I wish to speak my own opinion with all emphasis, that our duty is to improve or to relieve the condition of our patients as much as is in our power, and to do as little harm as possible, and that this applies fully as much to what we say to them as to the drugs that we administer. I must repeat again that it is always necessary to individualize. One can bear the knowledge of some affection of the heart (many are almost frightened to death by the suggestion of heart trouble), of the kidneys, of pneumonia, etc., better than another. Again, while it may be cruel to tell the patient he has locomotor ataxia or other dread disease, yet in case of chronic disease it is but kindness to let him know his illness will be of long standing, and thus save him the bitterness of a thousand disappointments.

There is no part of the psychic treatment of disease more important than what we have just been considering, the mode of examination of the patient and the diagnosis and prognosis given him; but I must now pass to what appears to be more direct psychic treatment, the attempted cure of disease by the ideas presented to the mind, or, let me say, suggestion. The simplest and most direct manner of the application of this treatment is the saying to the bed-ridden *you can* walk; to the blind, *you can* see, or *you will* be well at a stated period; and perhaps the patient will walk, or see, or be well at the stated time. Such brilliant results could scarcely be expected elsewhere than in hysteria, and rarely even here. This kind of suggestion should be made with great caution, for an entire failure may cause the patient to lose confidence in his physician. The suggestion is more likely to be successful if the effort be directed to removing one symptom at a time, than in trying to remove the disease *in toto*.

We have next to try suggestion with the help of reputed therapeutic measures. In this instance the suggestion of a cure need not be a verbal one on the part of the

physician. Indeed, there are times when promises arouse only a doubt in the patient's mind. It is especially unfortunate for the physician's influence if he have a routine method of making promises. At least it is a great aid if the suggestion be made to the patient's mind without any assurance from the physician. This suggestion may occur through the patient's having heard that the same medicine cured a case just like his own, or that the physician cured a case like his, or that the reputed effect of the drug given him is to cure cases like his. Again, some knowledge of the effects of, or a vague feeling of respect or awe as to, a given agency, as electricity, massage, etc., may lead to the expectation that it will cure his disease. And here the personality of the physician counts for much, the inspiring effect of his presence, his reputation—therefore, the influence of the consultant, of the physician for whose advice the patient has traveled a great distance, etc. To all this is to be added, when needed, the statements and assurances of the physician. It is the wise physician who knows how to turn these various measures to best account, who knows when and what to say, how to ward off the ill effects of disappointments, and maintain the hope and confidence of his patient. As to the selection of his therapeutic measures the physician should be guided by the character of the case. If the case apparently need nothing but psychic treatment, it will be indifferent what he selects, so that it produces the proper mental impression, and can do no harm. But as a rule he will look upon the psychic treatment as only an aid, while he treats the disease by accustomed methods. In that case he tries at the same time to make the appropriate mental impression, which will be the more easily accomplished the quicker the applied measures improve the patient's condition, or ameliorate his symptoms.

I wish to emphasize what I have already said, that we are learning to know more and more that the effects of

therapeutic measures are often from their influence upon the mind, and this to an extent not formerly dreamed of. Indeed, there are some skeptics who see in electricity, massage and like measures no other therapeutic power than that of suggestion. I do not doubt that this view is erroneous, though I feel assured that in many instances this is their chief, if not only, virtue. And particularly is this often true of operations that are made for the cure of nervous disease. I am quite confident that in many of the cases I have seen, in which operations—upon whatever organ—have been made for nervous disease, the effect was, chiefly, through the mind. Inasmuch as there are often shadow sides to such operations, it is to the highest degree essential that they should be resorted to with the greatest circumspection.

I have already spoken in part of utilizing the emotions in therapy. The pleasurable emotions, joy and the like, from whose influences we obtain most benefit, can be aroused by the physician, as a rule, only in the ways already referred to—in giving a favorable prognosis and through cheering words and presence. What should the physician attempt to do with the painful emotions, fear and pain? We have already seen that a fright has suddenly cured hysteric manifestations, paralysis, aphonia and the like, and even attacks of rheumatism and gout.

To some extent we are accustomed to make use of this agency in therapeutics; for instance, strong electric or other painful applications for the cure of hysterical aphonia or paralysis or to check a hysteric convulsion, and even surgical operations or the threat of the same. But this must be said of this manner of treatment: Fright is like a double-edged sword; it can cut both ways. It can do harm as well as good, and, unfortunately, we cannot usually tell in advance whether the good or ill effect will accrue. Therefore, we must always resort to such measures with great care. My own method has always been, and I believe

it is the only right way, to attempt to allay the feeling of fear, to tell the patient the measure is applied because of its curative power (he should never believe it to be a punishment or a menace), and that the pain will not be nearly so great as it appears. There will still remain sufficient of the element of apprehension, while the expectation of benefit is likely to inhibit the ill and increase the good effects of fear.

There is one manner of eliciting fear which is fraught with great danger, to which I wish to call especial attention. Its intention is to remove disease, but the almost invariable effect is to increase it and bring on new trouble. I refer now to a common habit of telling patients, whose minds are filled with fear or worry or other subjective source of distress, that they must cast these feelings aside or they will have disastrous effects, the disastrous effect usually mentioned being insanity. Now such patients do not really have the power to cast off these torturing feelings at will, and what power they have, they are robbed of entirely by the terror these suggested and threatened dangers inspire. And now these new fears prey upon their minds ceaselessly and not only add to their suffering and prolong the duration of their illness, but enhance the danger of the development of serious mental disease. This suggestion is not only common from the patient's friends and acquaintances among the laity, but is made too often by the nurse. And that is not all, nor would I have dwelt upon the matter in this paper, were it not that I have seen so many cases whose condition was made pitiable in this way, where the suggestions of ill were made by the attending physician.

I wish to add something specially applicable to the diseases in which psychic treatment counts for most, neurasthenia and hysteria. One should always bear in mind as regards these functional nervous troubles that worry about their condition, about the meaning of symptoms, about the disasters menacing them, is usually a constant source of

distress to the sufferers, and tends to prolong and aggravate their trouble. It should also be borne in mind that many patients are reticent about much that distresses them; the mental depression, the many morbid fears and obsession, especially the fear of insanity—common to very many neurasthenics—of committing suicide, etc.; and this reticence is likely to be maintained even toward their physician. It is my custom to attempt, so far as possible, to get at what is in the patient's mind, especially what worry and its causes. Then I explain to the patient the nature of neurasthenia, and inform him that such feelings and fears and impulses are very common in this disease, that they do not lead to insanity, and that with improved health all these torturing feelings will leave him. This information takes a great weight off his mind, a large step toward perfect health. Very often, too, such patients fear that anything they do may not be the right thing, and will do them harm, so that another great burden may be taken off their shoulders by laying out for them a full plan of living, the hours and time of rest and exercise and sleep, the diet, manner of recreation and employment, etc. It is very important, too, to give the neurasthenic an idea of the course of his disease, especially of its many ups and downs, so as to avoid the ill effects of a thousand disappointments, and maintain his courage throughout.

A word more as to the fears and obsessions of these cases. The morbid fears take many forms. A common one is the fear of being in open places, a broad street, an open square, or in closed places, church, theater, or any crowded place. With the fear there is usually a sense of confusion, of vertigo, of faintness or the like, and the patient generally believes that he would faint, be paralyzed, or even have an attack of apoplexy if he did not make his exit. Giving the patient to understand that all this is merely a nervous sensation, that there is no danger whatever, will be a great relief to him, and in mild cases enable him to

conquer his fears. In severer cases it is best for the patient to avoid altogether what arouses great fear, to begin with the conquest of what causes comparatively little anxiety, and by slow steps attempt to gain complete mastery over his fears. In the meantime his nervous system is to be strengthened in all possible ways, while, at the same time, he may be aided by the suggestion that this remedy or that will help him to regain his self-control.

The obsessions—imperative ideas—are often more difficult to control. One great fear on the patient's mind is that these ideas which cling to him, spite of all that he can do, indicate that he is to become insane, if he be not already so. The assurance that this is a common symptom of nervousness, that it is not a sign of, and does not lead to, insanity, is a great relief to him. In some instances, again, the special impulses are a source of great mental distress. For instance, a woman feels an impulse to kill her child, and the fear that she might do so nearly drives her to distraction. The positive assurance that in cases like hers the impulse never leads to action, lifts her from hell to heaven, and is a great help toward her cure. Bad cases will, of course, need much more than this, but of the special indications in special cases, or of general treatment to strengthen the nervous system, always called for in these instances, I cannot enter into here.

Experience teaches us that sickness often changes the disposition and character. It may make a hero of a coward, or a coward of a hero. The invalid may become the tyrant or the tyrannized. At the same time what influences one favorably, injures the other. A degree of sympathy is a balm to one, while it only suggests gravity of disease and increases the trouble in another. Or a stern harsh word may in the one instance arouse the weakened will-power and do good, while in the other the patient believes he is neglected, maltreated or not understood, and the emotional disturbance that ensues only injures him. I mention this

in reference to seclusion as a mode of treatment of hysteria and neurasthenia, so popularized since Weir Mitchell introduced his rest-treatment. There is no question of the great value of this mode of treatment, and, at the same time, we need but to look around to see the numerous instances in which it failed, if it did not do harm. This is because cases were not properly selected, because they were not specially studied as to the effect the treatment would have upon the patient's mind. What I said before was merely to indicate that we must individualize, and never apply such a powerful measure as a routine practice whilst we know that the influences favorable to one are injurious to another. We should study the effect of the patient's surroundings upon him, the influence of his family and friends, with reference to what effects a change would produce. We should study at the same time his disposition and needs. It should not be forgotten that while mental rest is always a chief desideratum in the rest-treatment, in many instances seclusion is not mental rest. It merely gives the patient the opportunity to feed his morbid thoughts and fears. In my own experience failures in the rest-treatment have occurred, chiefly, where there was a strong mental element in the case. Often modifications of the treatment will do good where rigid enforcement of seclusion fails.

A few words as to the treatment of a hysteric or hysteroepileptic attack. I have rarely been called to a case of this kind but that the following spectacle was presented: A number of excited people in the room, some bemoaning the patient's condition, others trying to do something though usually doing more harm than good, in general, confusion prevailing and the patient's condition tending to get worse. Clearing the room of the excitable throng, paying little heed to the patient, or the quiet assurance that the attack is about over, very rarely fails to bring an immediate change and speedy end to the attack. What I wish now to particularly emphasize is the suggestibility

of patients in whom consciousness is somewhat blunted. (It is often so to a very high degree in hysteroepileptic attacks.) I have already spoken of suggestion acting in a subconscious manner. It has been thought that patients are amenable to suggestion in the early stages of anesthesia from chloroform or ether. The idea I wish to bring forward here is that patients in a condition of stupor or blunted consciousness may also be amenable to suggestion, and be influenced by words spoken in their presence. As in hypnotism, the suggestion is more powerful than when made to the waking mind, so it may be true in this instance, and, at the same time, nothing be known of the suggestion either by the patient or by the suggester. Whether there is anything in this idea or how much I do not know, but in the treatment of stuporose patients I have, as a matter of caution, formed the habit of telling those at the bedside to say nothing but what might have an encouraging effect while within earshot of the patient.

Finally, a few words on strengthening the will-power, so weakened in many cases of hysteria, and, to a less extent, in neurasthenia. Systematic gymnastic exercises, done with vigor and precision; systematic employment; systematically undertaking what is uncomfortable or almost painful —for instance, a cold plunge-bath; trying to hold in check each rising passion; trying to force the direction of one's thoughts, especially if they are flowing in unhealthy channels (the hypochondriac trying to turn his thoughts from bodily functions, the despondent bankrupt from his business transactions and their results, and the causes thereof, etc.), directly exercise and strengthen the will-power, while each successful effort in that direction makes future efforts easier. But in many instances this is an exceedingly difficult undertaking, and the patient needs all the help he can get from the advice, the constant watchfulness and guidance, and exhortation, of the physician.

Herewith I close this brief sketch of modes of psychic

treatment. I have not spoken of hypnotism, though it has proven in some instances to be a powerful and effective therapeutic agency. But the measure of its usefulness is yet illy defined, its results very uncertain, ill effects not always to be avoided, and it seems to be the consensus of opinion that its practice requires special preparation and should not become a part of the armamentarium of the general profession.

Nor have I spoken of many important agencies in psychic treatment, brain and muscle work, methods of entertaining, amusing, etc., nor of special measures applicable in special diseases, for this paper has already exceeded its intended length. What I have presented for the largest part will not appear new to many practicians. But it is not enough that the physician should acknowledge or recognize the propriety of such instruction and the value of such measures; but they should become to him, if I may use an expression apparently so paradoxic in this instance, what Oliver Wendell Holmes termed finger-end knowledge, knowledge always at hand and applicable in the presence of the patient.

DISCUSSION

Dr. H. J. Herrick, Cleveland: This is an interesting paper. It is an interesting subject and one that pertains to the daily practice of every physician. If you have a psychic influence, it may have a wholesome or evil effect. In this subject we are very much in danger of treating the term "disease" too abstractly. No one can practice who does not deal with facts. You cannot put your finger on one single condition and say this is a fact. We know of certain means to be used in all mental disturbances. Does the gentleman suppose we can restore a broken leg by psychic influence, or heal a wound or restore an amputated limb? They are physical defects and no mental phenomena will restore them. Certain nervous disorders we call diseases; they are symptoms. We need to define what we mean by disease. A disturbance of nutrition is a disease. You may give it terms and symptoms and phenomena, but it is simply

symptoms we treat. We use the term hysteria, but that is not a disease. I sent a patient to Dr. S. Weir Mitchell some years ago, and he called the disease from which she suffered hysteria. When in Philadelphia recently I questioned him as to the application of the term hysteria. In reply he told me the story of a Frenchman who had been in this country. On his return home he was describing his experience with the American language. He said he could not describe the language. There was such a confounding of terms as to make the language incomprehensible. One term in particular always puzzled him; though it was used a great deal; he had tried but he could not analyze the term. It was "Damfino." That is hysteria as defined by Mitchell. We have a psychic influence upon persons. We exercise influence upon the mind of another, not upon cattle. We cannot treat diseased cattle that way, but if we inspire a sick person with hope, we benefit him with encouragement. That is suggestion.

Dr. Mary J. Finley, Mansfield: It would seem a fact as the speaker has said, psychic treatment of disease does not rest upon a scientific basis. This, however, is not the fault of the psychic treatment of disease. It is the fault of our science which should be changed to keep in line with the facts. Instead of decrying the success of psychic treatment, because in the hands of quacks and enthusiasts, we should try to put it on a scientific basis, to discover the laws upon which that success depends.

Dr. C. F. Hoover, Cleveland: I want to take Dr. Herrick to task for one statement, *viz.*: "Hysteria does not occur in the lower animals." On the contrary, very good examples of hysteria have been observed in dogs. An Irish settter was lost and brought to the pound. The following morning the animal was found to have hemianesthesia. The dog was reclaimed by his master and the hemianesthesia promptly disappeared. All diseases have been recognized as clinical entities before the pathology is understood. If we were not permitted to classify clinical pictures before the pathology is known, all clinical progress would cease.

Dr. E. Pearce, Steubenville: I was very much interested in the paper. I think there is a great deal in this subject. There is something almost intangible about it and un-

less we give it attention and are fortunate enough to succeed occasionally, we pay perhaps less attention to it than we should. Hypnotism expresses it as well as anything else. It is something akin to what is known among public men as magnetism. Some men can exert it better than others. I am inclined to believe some men can exert it on some people better than on others. Where one physician would succeed with a certain patient, another would fail because he had not that personal magnetism that adapts itself favorably to the patient. I have been greatly interested in the subject for two years. I have not made it a specialty but have come across some cases that have forced the matter on me. Gentlemen may say where there is nothing you can diagnose as organic, what symptoms you have in the case are symptoms only. The fact is, perhaps, I am not as capable of making as many correct diagnoses as when I commenced the practice of medicine, or as I thought I could then. Still, I believe, I have practiced it quite as successfully and made as many correct diagnoses as the scientific bugologists. Within the past year and a half I have had a case, a widow, who had a train of nervous symptoms of which irregular action of the heart was the most prominent. She was seemingly near dissolution. I examined her several times but could never discover anything organic. The attacks were frequent and severe. She had indigestion and a train of symptoms indicating chronic dyspepsia. She got into a condition where she could not sleep. I changed her manner of living in every way; changed her diet; gave various hypnotics; finally got to the point where I knew nothing more to do in that way. I finally suggested to her that she allow me to try hypnotism or suggestion to induce sleep, which I hoped might induce sleep. I went to the house at ten at night; the patient in bed. I told her I wanted her to fix her mind on sleep, to believe that she would, as I was going to put her to sleep. In fifteen minutes she was sleeping and rested well that night. This hypnotic influence was used every evening at bedtime for a week or more, with very beneficial result, the sleep habit at night being established.

Dr. J. U. Barnhill, Columbus: I want to endorse this carefully prepared and rational paper. I am very glad to hear a paper upon this subject from the distinguished gentleman, who has reviewed it from a scientific standpoint. All admit

the influence of mind upon mind in the treatment of disease. Collectively we are very sceptical, but individually we have a good deal of faith along this line. In view of the extravagant claims made by different schools and individuals in every community for psychic influence in the treatment of disease under the title of hypnotism, clairvoyance or christian science it seems a very opportune time to have an expression from the regular profession. We are glad to get it from the State Society. This paper is significant for the limitations it places on psychic therapy as well as for the claims it makes for it. It points out the manner in which psychic influences aid in curing diseases. Mental stimulus aids nutrition by strengthening the heart's action and circulation. Joy and good cheer thus improve nutrition and become factors in curing disease. Many diseases depend to a large extent upon impaired nutrition; neurasthenia and hysteria are conditions in which impaired nutrition plays an important role. Impaired nutrition makes the invasion of bacteria possible. The improvement of nutrition is an important factor in warding off the tubercle bacillus and other bacteria. Thus psychic influence may aid in curing disease. They are overestimated, however, by so-called "faith-healers." We make application of this agency at the bed-side. It is of course most valuable in functional diseases but its value in aiding recovery from organic lesion should not be underestimated especially in promoting nutrition and improving the general health.

Dr. Zenner, closing: I regret that I could not read my paper without omitting part of it. I could have given the gentlemen a better idea of what I intended to convey. I was sorry to hear the tone of the first speaker. I prepared the paper because I do not think as much attention is paid the subject as should be. I think every practician will acknowledge the influence of mind. It is not even true that if you have a broken bone, the mind will have nothing to do with its cure. Take two patients: one patient thinks he is going to get well; the other that he will die. I think you will find a very decided difference in the progress of the two cases. In this paper I wanted especially to speak of the influence of suggestion. I do not refer to hypnotism, but to suggestion of an idea to a conscious mind. I think the profession is coming to know that many of the

effects of medicine, both for good and ill, are produced by their influence on the mind. Some have claimed electricity has no effect other than that of suggestion. I do not believe that, but I do believe that suggestion plays a part in the results obtained from its use. The more clearly we recognize this, the more it will help us to do less harm and more good.

The great influence of the emotions on health and disease is, in part, shown in the frequency with which phthisis occurs in melancholia, where there is depression, and its infrequency in mania, where there is usually an exalted mental state.

I wanted to bring out in the paper also the special influence the physician may have over his patients in some diseases. I do not think there is any other subject of equal importance to the practician.

A SUMMARY OF CERTAIN STUDIES IN THE MORBID ANATOMY OF EPILEPSY

BY A. P. OHLMACHER. M. D., GALLIPOLIS

Director of the Pathologic Laboratory of the Ohio Hospital for Epileptics

It seems especially appropriate to bring before the State Society this first verbal report upon a line of investigation now being prosecuted in one of Ohio's hospitals in a laboratory supported by State endowment. This work, which was begun under its present directorate at the Ohio Hospital for Epileptics last July, has as its principal motive the study of epilepsy, though no intention exists of narrowly confining it to this particular purpose.

When the work was inaugurated, it was determined to approach the problems surrounding the pathology and etiology of epilepsy entirely unprejudiced by preconceived theories; to be noncommittal to the uric-acid hypothesis, uninfluenced by the claims of doubtful alloxuric bodies, and

conservative upon the other aspects of the now popular autointoxication theory.

The plan proposed for the work was, first of all, to subject to exhaustive scrutiny the material obtained at necropsy in the hope of ultimately establishing what has always been lacking as a rational foundation for the study of epilepsy; that is, *a morbid anatomic basis.* With its seven hundred patients representing all varieties of epilepsy and the epileptic insanities, and with an available necropsy material of from 20 to 30 cases annually, no better field than this institution for our study could be found on this continent; and, in this connection, I cannot forego the opportunity of publicly expressing my sense of obligation to the enterprising manager of the hospital, Dr. H. C. Rutter, and to the Board of Trustees, for their broad-minded policy in establishing a laboratory to utilize this vast and valuable material, nor can I fail to record my admiration for the steadfastness with which they have pursued this pioneer step in the face of many obstacles.

One who will review the literature bearing upon the pathology of epilepsy will be struck by the meagerness of the reports upon postmortem observations, especially when scrutinized by the exactness and detail demanded by modern pathologic research, and it may be that our good fortune in finding some hitherto undescribed and striking gross pathologic conditions is due to the application of more thorough methods. Be that as it may, it is a fact that in eight out of eighteen cases which have been examined postmortem since last July, a peculiar series of anatomic alterations have been encountered. The eighteen cases which came to necropsy represented various types of epilepsy, as, for instance, idiopathic *grand mal,* irritative or Jacksonian epilepsy, the epilepsy of idiocy and imbecility. Naturally, various lesions were found in these cases, some of them extremely interesting; and the inconstancy of the gross pathology in the cases of the secondary epilepsy of im-

becility and idiocy, and of the Jacksonian type, seems to be precisely what would be expected from the clinical manifestations. The full detail of the study of the first six of these cases was given in the *Bulletin* issued by the hospital in January last; and in another *Bulletin*, to be issued soon, the result of the clinical and pathologic study of the eighteen cases will be fully recorded.

In the eight cases, however, the gross pathologic findings which should be especially emphasized at this time, may be summarized as follows: A persistent and enlarged thymus gland; a pronounced enlargement of the intestinal and splenic lymph-follicles; a more or less pronounced hypertrophy of the lymphatic glands, and of the lymph-adenoid follicles of the tongue, larynx, trachea, esophagus, tonsils, and even of the stomach; a narrowing of the arteries; an abundant development of fat; and certain osseous changes indicative of old rickets. Not all the abnormalities comprehended in this summary were present in a single case, though the persistent thymus, with one or several accessory features added, was constant. The patients were young adults, varying in age from 17 to 35 years. All of them, except one, suffered with epilepsy from childhood. In at least six of the cases the clinical histories were those of idiopathic *grand mal*. Four of them had periodic mania. One man died from maniacal exhaustion; one committed suicide; two of the women and one man were found dead in bed, after having retired in apparent good health, which is to say, that out of eight cases there were three cases of *sudden death*.

The most prominent anomaly in these cases was the large thymus body, and it was this peculiarity which led to a study of the literature in which at least two other morbid conditions were found with the same anatomic features as presented by our epileptics. These conditions are *laryngismus stridulus*, or "thymic asthma," as the Germans call it; and sudden death in adults with no assignable lesion. Both

thymic asthma and its sudden fatalities in infancy, and thymic sudden death in adults, are conditions of extreme interest, and they are quite as mysterious in their causation as epilepsy. In reviewing these subjects it was found that thymic asthma had been classed among the partial epilepsies, and in the report upon four of our cases in the January *Bulletin* the attempt was made to trace a clinical, as well as anatomic, analogy between thymic asthma, thymic sudden death, and epilepsy.

Taken in their entirety, the morbid anatomic conditions which were found in our eight epileptics, and which have also been found in thymic asthma and thymic sudden death, make a picture of what the German pathologists style "the lymphatic constitution." Here the persistent and hyperplastic thymus is not the only important feature, for aside from it there is a general lymphatic hyperplasia, and a narrowing of the arteries, and often evidences of rickets. How this peculiar morbid condition, which has been described more or less perfectly for nearly a century in connection with laryngeal spasm and sudden death in infancy, is related to the clinical symptoms and lethal ending, is not known, and this is precisely the case in relation to our work, in which the same condition has been shown to be present in a certain proportion, at least, of cases of idiopathic epilepsy. To account for these singular anomalies in their relation to the malady which we know clinically as idiopathic epilepsy, must, at present, be a purely speculative task; and speculation has too long held sway in the theories that have been advanced to account for this mysterious disease. What we most need in the study of this affection is, as has already been said, a firmly established morbid anatomic basis, and when such a foundation is fully developed, the time for experiments along certain lines suggested by the morbid anatomy will have come. To establish such a basis, the thorough study of a large material by all the methods of modern pathologic research is necessary, and to this end the work

now in progress in Ohio's great colony for epileptics is aiming.

DISCUSSION

Dr. D. N. Kinsman, Columbus: It is not a subject I suppose any of us can throw great light upon. A firm pathologic basis is not yet reached. It is interesting in this connection, that in these cases the lymphatic tissues, the producers of the leucocytes, the structures engaged in proliferation, are active, are fully developed. Another feature is this: it shows close relation to some of the more recent contributions made in regard to the uric-acid diathesis alluded to. If that and the other deductions that have been made as to the congeners of uric acid, are true, we are yet to find a solution of the problem of epilepsy. It is certainly a more promising field than we ever have had. We are all familiar with what has been done in the microscopic examination of the brain in epilepsy. Rachford believes that paraxanthin bears a relation to some forms of migraine and some forms of epilepsy. It does not always follow, and I myself think the uric acid has very little to do in the causation of epilepsy. What its congeners have to do, I do not know.

I want to congratulate the Doctor upon this most excellent contribution, one of the few that have ever come from an Ohio Institution.

Dr. F. Warner, Columbus: I have been listening to this paper with great pleasure and it seems there is to be much good come out of the work the author has instituted. But while this is proceeding, we cannot let cases of epilepsy go without looking after the treatment as best we may. We have heard much of the surgical treatment of epilepsy, trephining the skull. We are inclined to look too little upon injuries of the skull without symptoms. We are directed not to operate for a depressed fracture unless that fracture gives symptoms. This is a mistake. Many times depressions of the skull bring changes in the layers of the brain and no amount of operation later will be of avail. Whatever may be the cause of epilepsy, I believe we have to look after the stomach, regulation of the bowels, etc., in the course of treatment. Careful feeding and regulation of the

bowels are among the most important features in the treatment of epilepsy. I shall, and I know others will, welcome anything that promises cure.

Dr. J. B. May, New Holland: I would like to ask those experienced in the treatment of epilepsy, about the treatment by potassium bromid. It has been my misfortune to have a good many cases. I am holding them quiet under this line of treatment. Whether or not it will be a cure if persisted in long enough, I do not know. I thought, perhaps, some one in the convention might give us some light on the subject.

Dr. H. A. Hare, Philadelphia, Pa.: Mr. President, as you have called on me for some words as to the treatment of epilepsy, I may say that, about a year or eighteen months ago I made an investigation among various asylum superintendents as to their opinions concerning the value of the bromids in the treatment of this disease. My attention was first called to the matter by Dr. Weir Mitchell's report. One of his cases developed maniacal tendencies under this drug that had previously manifested no such symptoms. A full dose of bromid produced temporary insanity. As a result of this investigation, I found that the superintendents of asylums were almost unanimous in attributing the insanity of many epilepic patients to bromids. They believe that the bromids are deleterious to epileptics. A large amount of imbecility is due to the fact these patients had taken the bromids constantly. I would let bromids alone in general practice for epilepsy whenever possible. I expected to find the opinion of these superintendents was that the bromids had been abused, but I was amazed at the unanimity of the opinion of these men and their effort to impress upon the profession the fact that bromids were not curative but were exceedingly harmful.

It has already been said that a good paper has come out of a public institution of Ohio. I think this Society is to congratulate itself upon the institution and upon the pathologist who has charge of its pathologic work. This institution and the paper have carried the name of Ohio all over the world. Neurologists in this country and abroad are watching the results obtained from this institution with a great deal of interest. I for one, was interested in the re-

port already published and am looking forward with interest to the report in July.

Dr. C. E. Beardsley, Ottawa: I do not rise to discuss the theory of epilepsy or to present anything new in the therapeutics. Members of the medical profession meet with epilepsy all the time, everywhere, under all conditions and in all ages. When the institution at Gallipolis was established, it filled rapidly and overran its capacity. I want to say a word in regard to the establishment of that hospital. The people and the profession of the State of Ohio are under very great obligations to the management of the epileptic hospital for establishing this feature and putting competent men in charge. We are in a position to have some new light thrown upon epilepsy and I think it is now being done. I hope the profession will give the management every encouragement and urge them to pursue as far as possible, the investigation that has now been inaugurated.

Dr. Mary J. Finley, Mansfield: I would like to commend the literary quality of the paper. I fear many medical writers scorn literary excellence. In the haste of discussion careless construction is excusable, but when we sit down with pen in hand, in cold blood, we should not be guilty of such cruelty to the English language, as is common with us.

Dr. E. B. Fullerton, Columbus: I have had some recent experience in the use of an old remedy, that is borax, in the treatment of epilepsy. I have had in the past five years, four cases that I have treated with borax. In one case of *grand mal*, the seizures were controlled for eleven months. As long as he took the remedy he had no convulsions. Another case, after being put on the borax treatment went ten months without convulsions. A case of epileptiform hysteria which gradually, after the menopause, became simply, but decidedly epilepsy, was cured, having had no epileptic seizure in the past three and a half years. In another case the patient had nocturnal attacks, severe in character, occurring at intervals of from one to three weeks. In November, 1894, I put him on the borax treatment. Christmas day following, he had a convulsive paroxysm. After that the borax was increased and he has had no seizure since. For the

past three of four months he has been taking borax only occasionally.

My prescription is pulverized borate of soda, four ounces with one ounce of aromatic powder, the latter principally to conceal from the patient what he is taking, but in part, also, to prevent or correct indigestion likely to be caused by the remedy. Of this powder I give one-half to one teaspoonful in a little water three or four times daily; preferably after eating.

Dr. Ohlmacher, closing: In conclusion I wish to thank the Society for this very cordial reception of the paper, and the kind remarks concerning the work we have begun. The paper is the briefest possible summary of the results of investigation, which, when presented in full, will make an interesting contribution.

So far as treatment is concerned I have nothing to say, as it does not fall in my province. I am sorry the Superintendent is not present since he is competent to speak upon many of the questions that have arisen, and with a large experience, is in a position to give us much valuable information.

LUMBAR PUNCTURE

BY RALPH J. WENNER, M. D., CLEVELAND

The object of this paper is to review, in a necessarily limited way, the literature at my command on this subject, and to report a number of cases that have come under my care.

The procedure indicated by the subject was first performed on a man by Quincke in 1891, after years of experimentation on the lower animals. The operation was designed for the relief of the pressure-symptoms of hydrocephalus, to take the place of the more difficult and dangerous operations of trephining and puncture through the fontanelle.

Lichtheim, in a paper published in 1893, called attention to its undoubted value as an aid in making a diagnosis, and notwithstanding the fact that not all his claims have been

substantiated, the fact remains that in many cases it has afforded us the means of arriving at an early and positive diagnosis. Therapeutically it has not been attended by great success, although a number of cases are recorded of recovery from tubercular meningitis, in which the finding of tubercle bacilli in the cerebrospinal fluid confirmed the clinical diagnosis.

Cailli, in his report on Lumbar Puncture *(Pediatrics,* August, 1896,) found tubercle bacilli in the cerebrospinal fluid in four out of six cases of tubercular meningitis. In another case of cerebrospinal meningitis complicated by bronchopneumonia, the pneumococcus was found in the fluid obtained by puncture. This case recurred. A case of pharyngeal diphtheria showed *staphylococcus pyogenes aureus.* A case of pneumonia showed the pneumococcus, and a case of acute eczema and nephritis gave cultures of *streptococcus pyogenes.* A case of nasal diphtheria also gave cultures of *streptococcus pyogenes.*

Dr. Henry Heiman, of New York, reports *(Pediatrics,* February, 1897,) two cases of tubercular meningitis, in which the clinical diagnosis was sustained by inoculation, proving the presence of the bacillus of tuberculosis. Dr. H. H. Wentworth *(Pediatrics,* August, 1896,) published a report of 30 cases, some of which I will mention.

Case II, a case of cerebrospinal meningitis, showed the *diplococcus lanceolatus.* In cases VIII and IX the diagnosis of tubercular meningitis was sustained by inoculation. The diagnosis of purulent meningitis in case XIV was proved correct by the finding of numerous bacteria. Case XVIII was diagnosed as tubercular meningitis, but cultures were negative. Necropsy showed the pia studded with tubercles. No inoculation was made. In case XXIV a diagnosis of tubercular meningitis was sustained by inoculation. Dr. Worth of Vienna has found the procedure worthless so far as benefit to the patient is concerned, and has not had flattering results in a diagnostic way. It was not stated whether inoculation had been practiced.

Dr. Felsenthal *(Der Kunderarzt*, 1897, VIII-75,) reports two cases, the first of which, diagnosed as cerebrospinal meningitis, recovered after the withdrawal of a quantity of clear cerebrospinal fluid. The question whether it was a case of purulent or serous meningitis was thus settled. In this case unquestioned benefit followed the diminution of intracranial pressure. The second case, one of meningeal tuberculosis, did not end so well. The same author states that the incessant vomiting and violent headache can frequently be made to disappear by withdrawing fluid, thus diminishing intracranial pressure. He further states that a purely palliative result has frequently been obtained by this measure in tumors of the brain and in chronic hydrocephalus, which he considers of great value.

In hydrocephalus its chief value is to relieve pressure-symptoms. However, Quincke, in 1891 *(Berliner Klinische Wochenschrift* No. 38-39) reports a case of hydrocephalus cured by lumbar puncture. Dr. W. P. Northrup reports a case *(Pediatrics*, December, 1896) of epidemic cerebrospinal meningitis discharged from the hospital at the end of four months as cured. One month from this time, the patient was readmitted suffering extreme pain in the head and with fits of vomiting, projectile in their character. About four weeks from the time of his second admission he suddenly died. Necropsy showed instead of tubercular meningitis, an acute hydrocephalus. The ependyma was in a condition of subacute inflammation. No puncture was made in this case, but I cite it as one in which a puncture would, in all probability, have been followed by good results. It has been said that many cases of tubercular and many cases of serous meningitis, succumb to intracranial pressure. In tubercular meningitis we can in a certain number of cases palliate the condition, but in serous meningitis we have a right to expect much more.

One of the German medical journals published during the past year a report of two cases of tetanus, in which an

early diagnosis was made by finding the specific organism of this disease in the cerebrospinal fluid. Furbinger has reported two very interesting cases, that permitted no positive diagnosis, in which lumbar puncture was productive of much good. These cases were cited by G. W. Jacoby in the *New York Medical Journal* (December, 1895,) as follows: First case, a child ten years old, with right-sided hemiparesis, weakness of both abducentes, severe headache, slight dizziness and bilateral choked disc. After puncture, a large amount of fluid having been removed, headache disappeared, optic neuritis subsided and an apparent cure took place. The second case was a child six years old, with marked weakness of both lower extremities, not able to walk or stand, with loss of both patellar-tendon reflexes and bilateral choked disc. In this case very marked improvement took place. Lumbar puncture performed in a number of cases of meningitis has resulted in perfect cure.

Jacoby *(New York Medical Journal*, January 4, 1896,) reports two cases of spinal meningeal hemorrhage due to injury followed by paralysis of the lower extremities, loss of control of sphincters, and so forth, in which puncture permitting the escape of bloody fluid was followed by complete recovery in one case, in the other weakness of the peronei and extensors and loss of knee-jerk remained.

Dr. Otto G. T. Kiliani has reported a similar case in the *New York Medical Journal*, in which puncture permitted the escape of 8 ccm. of thick tarlike blood, decreased the paralysis and diminished the area of anesthesia. However, this patient died suddenly a few weeks after and no necropsy was obtained.

Dr. Chas. L. Dana has performed this operation in 15 cases of serous meningitis of alcoholism with three recoveries. The remaining twelve, he states, were practically moribund when operated upon. The point for operation lies, in case of children, between the fourth and fifth lumber vertebræ. It is preferable to insert the needle at this point be-

tween the spinous processes, thus avoiding the cord which sometimes extends to the lower border of the third lumbar vertebra and the *cauda equina*, which extends downwards in two broad bands, one on each side. The spinous processes are widely separated in infancy, while in the adult they overlap to such an extent as to make it impossible, in the majority of cases, to pass the needle at this point.

In the adult the point of insertion may be either between the third and fourth, or fourth and fifth, as the cord extends only to the second lumbar vertebra. The needle, which is inserted a finger's breadth to the side of the spinous process, with a direction upward and inward, may pass in from 2 cm. to 8 cm. In all my cases I have had the patient lying on the right side with the trunk strongly flexed. Before puncture the vertebræ should be carefully counted, and it is well to remember that a line drawn through the crest of the ilium pierces the body of the fourth lumbar vertebra. The operation is in no wise dangerous if strict cleanliness is observed. The amount of fluid varies from a few drops to a number of ounces and may come away drop by drop, or with a spurt. In all my cases, raising the head and shoulders caused the fluid to flow more rapidly. Deaths have occurred from six to twenty-four hours after puncture, in cases of cerebral tumor. It is possible in these cases that the removal of the cerebrospinal fluid allowed the growth to press upon vital structures, thereby causing death. The normal cerebrospinal fluid is clear as crystal and contains neither cells nor fibrin. In all cases of meningitis there is cloudiness, which may be so slight as to escape notice unless the fluid is held up to a strong light. In cases of tumor of the brain sugar is often present in considerable quantity in the fluid. In cases of meningitis the albumin, of which there is but a faint trace in the normal fluid (1-50 of 1%), is often increased, sometimes reaching 1%. Bacteria are often found in the fluid, thus affording positive evidence of the variety, and many times the source of infection. In all cases inocu-

lation experiments should be performed. In tubercular meningitis cover-slips and culture-tubes often fail when inoculation produces evidence that cannot be questioned. I shall now take the liberty of reporting the cases I have punctured. Many of these cases were moribund at the time they were operated upon, and puncture was made simply as an aid to diagnosis.

Case I.—A. M., male, aged 40, contracted syphilis five years ago, for which he had been treated intermittently. There were numerous copper-colored scars about the legs and ankles. About July 1, 1896, the patient began to complain of excruciating pain limited to the right side of the head and always worse at night. Iodid of potassium was given to the limit of toleration. He became stupid, vomiting occasionally and complaining of pain in his head. He would do anything suggested to him in a jerky automatic manner. Urine was voided without his knowledge. Ophthalmoscopic examination showed double optic neuritis. A diagnosis of syphilitic meningitis, with probable gummatous growth in the region of the pain was made. Fluid obtained by puncture was slightly cloudy, contained 1/20 of 1% of albumin and considerable sugar. A portion of the fluid was examined by Dr. Howard with negative results. Following puncture the patient slept quietly, for the first time in four days. A few days after, the patient growing worse, a second puncture was made, withdrawing 35 ccm. of cloudy fluid, which was sterile and contained ½ of 1% of albumin and sugar. The patient died a few days after this and a necropsy on the head alone showed marked thickening and roughness of the dura, dense adhesions in the region of most pain and numerous adhesions between the dura and brain. Section of the brain showed a large tumor in each lobe of the cerebrum, springing from the lateral ventricles, and small cavities in each lateral lobe of the cerebellum, connecting with each other through the middle lobe.

Case II.—J. D., farmer, aged 56 years, was injured in a

runaway August 30, 1896. The pupils were sluggish, there was involuntary action of the bowels, stupor and delirium. The temperature was elevated and the pulse was rapid. Through the kindness of Dr. C. B. Humiston, I was permitted to make a puncture, but no fluid was obtained. The needle was withdrawn and reinserted twice, going in about 6½ cm., but no fluid could be gotten.

Case III.—J. H., aged 35 years, while intoxicated fell down stairs, striking on his head. The temperature was 102.2°, and pulse 130; he was semiconscious. The right arm and right side of the face were paralyzed and movement of the right leg was slow and weak. 10 ccm. of bloody fluid were withdrawn by puncture. After standing six hours there was a sediment composed of polynuclear, red blood-cells, leucocytes and fibrin. The patient was also trephined over the right arm-center, where the dura was found tense and bulging. A small incision was made in the dura, permitting about a teacupful of bloody fluid to escape. The patient died the following day and a necropsy showed bloody fluid in both ventricles, a clot in the left lobe of the cerebrum, interrupting some of the fibers of the internal capsule, and a clot about the size of a hickorynut in the anterior portion of the right lobe of the cerebellum.

Case IV.—J. F., male, 40 years of age, was injured September 24, 1896, by falling from a wagon on his head. The patient was unconscious with contracted pupils, stertorous breathing, a pulse of 120 and temperature of 101°. Through the courtesy of Dr. J. E. Cook, I was permitted to puncture, drawing off 20 ccm. of dark bloody fluid. On this being allowed to stand several hours, red cells, leucocytes and fibrin were thrown down, leaving the supernatant fluid distinctly cloudy. The patient died two days after puncture, and necropsy showed a clot about the size of a hand between the dura and brain, occupying the anterior and middle fossa. The right ventricle contained a large softened clot.

Case V.—This was a case of *spina bifida* in an infant, un-

der the care of Dr. John Thomas. The integument was beginning to ulcerate in spots, and the little patient was showing symptoms of spetic meningitis. Puncture of the sac, withdrawing 24 ccm. of cloudy fluid, was not followed by any untoward symptoms. Pure cultures of *streptococcus pyogenes* were obtained.

Case VI.—Tubercular meningitis in a child, aged 2 years. Fluid obtained by puncture was cloudy and inoculation of a guinea-pig proved the diagnosis to be correct.

Case VII.—B. G., male, aged 52 years. Tuberculosis was present on both sides of the house. Five years ago the patient contracted grip, following which he had consolidation of the upper lobe of the right lung; there was an afternoon temperature, night-sweats and emaciation. He had at least a dozen hemorrhages, some of which were quite severe. At one time his condition was so critical that his death seemed to be but a matter of a few days. However, at this time, when his condition seemed so hopeless, he commenced to get better, until at the end of two years he seemed to have regained a portion of his former health. About this time he commenced to have excruciating pain in his head, accompanied by retraction and nausea. His suffering was so intense that it was necessary at times to administer morphin. His condition continued to grow worse, his pupils being unequal and pulse varying from 30 to 60 beats a minute. A knowledge of his previous ailment, his family history and the symptoms enumerated above, seemed to warrant a diagnosis of tubercular meningitis. On November 12, 1896, 10 ccm. of cloudy fluid were withdrawn. The sediment obtained by centrifuge showed a few leucocytes and some shreds of fibrin. Cultures and inoculation were negative. Following the puncture the patient slept, and on awakening, observed that his headache was gone. In a few days he was up and about the house. Six months after this the pain in his head returned, although not nearly so severe as before. A second puncture, inserting the needle four times, failed

to bring fluid, and a third attempt with four insertions was equally futile. However, after a few weeks the headache ceased, and at the present time he is attending to his business, that of a real-estate agent.

Case VIII.—Baby W., aged 3 months. One parent has a specific history. The child was very small at birth, with an "old-man" face and "snuffles." Shortly after birth the little one began to twitch and jerk and have convulsions. Knowing the history of one parent, I immediately used antisyphilitic treatment with no marked benefit. When two months old, cataract developed in both eyes. The consent of the parents having been obtained, the child was punctured and 4 ccm. of cloudy fluid were withdrawn. This was given to Dr. Howard for examination, who reported inoculation and cultures as negative. The child is now two years old, fat, and seems to show some intelligence. The cataracts are being slowly absorbed. I cannot say that the puncture had any good effect; it was undertaken as an aid to diagnosis. The clinical diagnosis was syphilitic meningitis.

Case IX.—G. S., aged 5 years, while convalescing from pharyngeal diphtheria, began to complain of headache and to vomit incessantly. Twenty-four hours after the beginning of these symptoms, the patient began to have convulsions and retract the head. There was constant twitching of the muscles of the face and neck and both corneas began to ulcerate. 16 ccm. of cloudy fluid were removed by puncture. Coverslip preparations showed polynuclear leucocytes and fibrin, but no bacteria. Cultures and inoculation were negative. Necropsy showed a thick gelatinous exudate over base and entire cortex. No tubercles were to be found.

Case X.—G. O., aged 2 years. This child had been treated for whooping-cough for several weeks by Dr. Pasko, with whom I saw the case. At this time the child was unconscious, and having convulsions every few minutes. By puncture I succeeded in getting 10 ccm. of cloudy fluid. On three different media I got pure cultures of an organism

corresponding to *diplococcus lanceolatus.* The withdrawal of the fluid had the effect of lessening the number and severity of convulsions. The relief was only temporary, for the next day the little sufferer died.

Case XI.—J. D., male, aged 49, was taken sick about May 1, 1897, with symptoms of typhoid fever. The symptoms referable to the digestive tract subsided in a short time, but the brain trouble continued to grow worse. He was restless and delirious; there was twitching of the muscles, vomiting, retraction of the head and stupor. On May 15, 1897, through the courtesy of Dr. House, in whose care the patient was, I was permitted to make puncture, drawing off 12 ccm. of very cloudy fluid, containing large flakes. Pure cultures of *streptococcus pyogenes* were obtained. The patient died the following day and no necropsy was permitted.

Case XII.—N. D., female, aged 24. This patient had been operated on by Dr. G. W. Crile, at the City Hospital, for cyst of the cerebellum. There was great improvement for a time, but later she was readmitted, suffering with the same symptoms as before. The fluid obtained at the operation could not be differentiated from cerebrospinal fluid, and accordingly lumbar puncture was performed and about 20 ccm. of clear fluid withdrawn. There was 1-20 of 1% of albumin and some sugar present. Following the puncture, the patient suffered excruciating pain in the head for a number of days. This, to my mind, proved conclusively that there was no connection between the cyst and the ventricular cavities, for following the operation of opening the cyst there was marked amelioration of all the symptoms, while puncture seemed rather to aggravate than to palliate.

Case XIII.—J. W., aged 28, an epileptic idiot, has been in the institution 10 years. He has had fits since he was five years of age. Two punctures were attended by considerable pain. No fluid was obtained.

Case XIV.—J. W., aged 35 years, has been in the insti-

tution five years. He has had fits since he was 15 years of age. Three punctures gave no pain. No fluid was obtained.

Case XV.—H. G., aged 36, an epileptic idiot, has been in the institution ten years and has had fits for fifteen years. Three punctures caused no pain and produced no fluid.

Case XVI.—F. W., aged 36. At the time of his admission to the institution, 19 years ago, he was weak-minded. Fits developed two years after admission. No fluid was obtained by three punctures which were painless.

Case XVII.—E. W., aged 34, an epileptic idiot, has been in the institution ten years and has had fits for 20 years. Two punctures caused some pain but no fluid was obtained.

Case XVIII.—J. H., aged 12 years, has been an idiot from birth, but never had fits. Two ccm. of fluid, slightly cloudy, were obtained. The boy was punctured twice after this, cloudy fluid being obtained each time.

Case XIX.—W. B., aged 24, shows numerous and marked stigmata of degeneracy. He is a notorious "firebug." He has never been known to have fits. In this case 32 ccm. of clear fluid were obtained. No pain attended the puncture.

Case XX.—C. B., aged 50, a violent epileptic, has had fits for 20 years. Three punctures unattended by pain failed to produce any fluid.

Case XXI.—P. M., aged 56, was married 22 years ago and has had fits ever since. Three painless punctures produced no fluid.

Case XXII.—J. C., aged 25 years, has had fits since he was nine years of age. Three punctures caused no pain and produced no fluid.

Case XXIII.—F. P., aged 35, female, an epileptic idiot, is absolutely devoid of intelligence. No fluid was obtained by four punctures. An anesthetic was used in this case.

Case XXIV.—M. P., aged 20, male, an epileptic idiot with same degree of intelligence as Case XXIII. Four punctures produced no fluid. An anesthetic was used in this case.

Case XXV.—L. V., aged 30, epileptic. Three punctures gave no pain. No fluid was obtained.

Case XXVI.—Man, aged 41 years, has been in the institution seven years, suffering with paresis and has had convulsions. Four painless punctures produced no fluid.

Case XXVII.—C. E., an imbecile. Four punctures caused no pain, produced no fluid.

Case XXVIII.—J. K., aged 23 years, is an epileptic. Two painless punctures produced no fluid.

Case XXIX.—C. M., aged 40 years, case of paresis with convulsions. Two punctures gave no pain and no fluid.

Case XXX.—J. F., aged 23 years, case of mania. Two punctures, very painful, gave no fluid.

Case XXXI.—G. J., aged 36 years, case of paresis. Four punctures gave no pain and no fluid.

Case XXXII.—J. L., aged 25 years, an idiot. Two punctures gave no pain. About a drachm of bloody fluid was obtained. This discoloration was caused undoubtedly by the puncture of a vein.

Case XXXIII.—S. F., epileptic. One puncture produced 32 ccm. of clear fluid, of neutral reaction and containing neither albumin nor sugar. The specific gravity was 1.005.

Case XXXIV.—D. G., epileptic. No fluid was obtained by three painless punctures.

Case XXXV.—V. W., epileptic. About 32 ccm. of clear fluid were obtained, having a specific gravity of 1.010 and containing neither albumin nor sugar.

Case XXXVI.—R. F., case of melancholia. Four punctures gave no fluid. The punctures caused no pain.

Case XXXVII.—H. F., chronic mania. Three punctures caused no pain and produced no fluid.

Case XXXVIII.—E. K., chronic mania. 32 ccm. of fluid were obtained by one puncture. It was neutral in reaction with a specific gravity of 1.010 and contained neither albumin nor sugar.

Case XXXIX.—H., general paretic. Three punctures gave no pain and no fluid.

Case XL.—F. W., sustained a crushing injury to the spine about five years ago that fractured several vertebræ of the coccyx. At present he complains of constant pain in the back and headache. The knee-jerks are almost abolished. A needle was inserted between the third and fourth lumbar vertebræ and 48 ccm. of clear fluid were withdrawn, neutral in reaction, with a specific gravity of 1.010 and containing a trace of sugar and no albumin. Following the puncture the patient was very dizzy and had to lie down; next day, however, he said he was feeling better than usual. As this case was punctured only last Saturday, it is too soon to say whether any result will be obtained by it.

In addition to those previously mentioned, I wish to express my thanks to Drs. Carpenter, Eyman and H. L. Wenner, to whom I am indebted for much of this material, and to Drs. MacNamara and Emerich for assistance rendered.

ALCOHOLIC HALLUCINATORY MANIA

BY EUGENE G. CARPENTER, A. M., M. D. COLUMBUS

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Of the external agents which enter into the cause of disease and from which source is developed such a wide range of pathology, none is so fruitful as that of the baneful effects of alcohol. In the field of general internal medicine we have hypertrophic sclerosis of the liver, nephritis, arterial sclerosis and a legion of other pathologic conditions which are in daily evidence of this truth upon the post-mortem table. In an equal degree does alcohol enter as an etiologic factor in the cause of a number of the forms of organic brain disease, *e. g.*, various forms of passive vas-

Albu—Autointoxication

cular congestion of the membranes producing a chronic pachymengitis, arachnitis, leptomeningitis, meningoenerphilitis or paresis. But in the realm of the pathology of the various forms of insanity does this toxic element play its chief role. On the continent statistics show that from ten to twenty percent of all the admissions into the asylums have at their basis alcohol as a factor of cause. No less authority than Kraepelin gives alcohol the credit for cause in thirty percent of all admissions in Germany.[1] It is no respecter of persons or class. The many thousand of its victims who pay tribute to its conquest are found in equal numbers among the rich and the poor, the intelligent and ignorant. It is not my purpose in so brief a time as is alloted, to make any attempt to discuss the whole range of alcoholic insanity, but to a condition which in reality amounts to a special form, and to its medicolegal aspects. I refer to alcoholic hallucinatory mania.

It has been hinted at by several of our best authors. Savage[2] has referred to it in discussing alcoholism; Clouston[3] in connection with chronic alcoholism with ideas of persecution; Kraft-Ebing[4] recognizes the condition, but Kraepelin discusses it as a special form. It is not a condition associated with commonly recognized organic forms of alcoholism. It stands as a positive clinical entity within the realm of the so-called functional forms. It is not, nor is it consequential, to acute alcoholism, or the "common drunk." It is not delirium tremens which I regard as but acute alcoholism added to the chronic alcoholic habit with a highly neurotic constitution. It is not dipsomania. The condition is one which presents itself to the eye as a true insanity, its chief characteristic that of hallucinations of the sense of sight and hearing, especially of hearing. I speak of true insanity as being a disease of the brain which presents itself, not having an organic pathologic basis such as is possible to be observed macroscopically or microscop-

1 *Kraefelin—Psychiatrie.*
2 *Savage*—Insanity.
3 *Clouston*—Mental Diseases.
4 *Kraft-Ebing—Psychiatrie.*

ically. On the other hand, it presents itself as do other forms of insanity in which we have been unable as yet to discover any definite organic lesion. True insanity manifests itself in the form of states of depression, of which melancholia is the ideal type, or in states of exaltation, of which acute alcoholism added to the chronic alcoholic habit with which the mental faculties as a whole are totally suspended. In addition we have delusional states which exhibit the brain under discordant activities associated with hallucinations which may be the result of gradual development out of an insane temperament, as in paranoia or the sequence of a previous attack under some regular form. Endeavoring to be more explicit, the condition alluded to in this paper is of the nature of a true insanity, characterized by hallucinations of sight and hearing in one long-addicted to the misuse of alcohol. I would say delirium tremens is acute delirium added to acute alcoholism, but this is insanity with hallucinations added to chronic alcoholism. I take it that in its pathology through the long-continued use of alcohol, the cortical cells have become paralyzed, their nutrition cut off, and the integrity of their function interfered with. According to the methods of investigation of the toxic effects of alcohol upon the cortical cells, as presented by Bevan Lewis[5] of England and Berkley[6] of this country, we would be able in such cases to find under the microscope cortical cells of cloudy, with more or less yellow granular degeneration of the pigment-bodies. In more advanced stages of chronic alcoholism we would expect to find this condition with atrophy of the dendrites present. The hallucinations which characterize this form are of the persecutory kind and give rise to delusions the especial outgrowth of the morbid disturbances of the sensory centers, especially that of the accusticus. In these hallucinations he is made the especial victim of persons who would humiliate him. He is forsaken by his wife, who would get rid of him for an-

5 *Bevan Lewis*—
6 *Berkley*—Johns-Hopkins Reports, Vol. VI.

other, and, prompted by jealousies the most intense and real, he may become a most dangerous homicide, or he may think he is especially picked out as being responsible for many deeds of which he never was guilty. He is criticized, made the butt of ridicule, thinks all his friends know of many of his past short-comings, that he is a murderer, a thief, that he was the cause of accidents where there was loss of life, that he committed arson, rape, and so on through the whole category which now brands him as a criminal and on account of which the world seeks his life. These sense disturbances annoy him day and night, and continue to intensify themselves, until, driven to desperation, thinking to escape them by destroying their source, he commits some act which brings him to court through complaint of his friends or by reason of some more serious offense which causes his arrest. By way of illustration, I wish to mention briefly three cases of this form which came under my own observation. The first was the case of an Irishman, a mechanic, aged 40 years. He was a regular habitué of alcohol, and at periods took it in excessive amounts for days at a time. After one of the sieges as a result of delusion, prompted by hallucinations in which he entertained a most absurd jealousy, he one day repaired to his home and shot his wife in the abdomen, from which she afterwards miraculously recovered, and, turning, fatally shot his own baby. He was arrested, and, after a hotly-contested trial before the Probate Judge to determine the question of his sanity, he was committed to the county infirmary for further observation. Being detained there for several weeks he improved, appeared free from any trace of hallucination, and, realizing the danger of again being tried for the murder of his child, he made good his escape and has never returned.

The second case was that of a patrolman, a chronic habitué, about 60 years of age; had served a period of 25 years on the Cleveland force faithfully, save the last two years of his service. During this time, for various negli-

gences, he had been censured by the superior officers, and as often placed on probation. Finally, through hallucinations of hearing, he began to be suspicious of his wife and family, insisting that they were conspiring against him. He was complained of as being insane and was brought before the Probate Judge for inquest. When I saw him the first day in jail he presented the picture of one suffering from morbid fear of being injured. He seemed on the verge of a maniacal attack such as you see in real acute mania. He sat trembling on his chair, perfectly speechless, and could not be prevailed upon to move. He was in a profuse perspiration, like one under great mental strain. He was constipated; his tongue was dry and parched; he would not eat, and the thermometer showed an increased temperature of about a degree. The next day I found him in a maniacal condition, chasing imaginary objects about his cell. Upon asking him for an explanation of his conduct, he said he was trying to defend himself from two negroes who were trying to push him into a deep pit. Before the Probate Judge, my opinion that this was a case of real insanity was opposed by the opinion of another of my colleagues that it was a case of malingering, or at worst delirium tremens. That he was a malingerer was not regarded tenable, as his retirement meant but half-pay as a pensioner, while if he continued upon the force it meant full pay for two years yet before his retirement on account of age-limit. He was committed for asylum treatment. Greatly improved in two months, he was discharged, although today I am informed he is not entirely well.

My third is that of one in private practice, a man about 30, a "book-maker" by occupation and an inveterate drinker the past three years. Although to all appearance a well man, his mind was filled with hallucinations of a persecutory nature and delusions of suspicion in regard to everyone with whom he had any dealings, and even of others, strangers to him, with whom he had nothing in common. He was

suspicious of all persons to whom he had given "tips" at races, and imagined he was the topic of their conversation. In a restaurant the beer contained medicine, a cigar purchased of any stranger was drugged, and at the same time it did not deter him from drinking the beer or smoking the cigar. I treated him at home, and, upon the theory that I had a toxic condition to deal with, I employed eliminatives, such as blue-mass pill, saline waters, followed by strychnin. Inside of three months he seemed entirely free of all his hallucinations and delusions of suspicion. The frequency in which the mental condition of these cases bring them into court is worthy of special consideration. The fact that their mental condition is one of true insanity, the resultant of the continued use of alcoholic drinks for various periods, differs in point of responsibility, I take it, from those cases where crime is associated with acute alcoholism which occurs so frequently. Alcoholic hallucinatory mania occurring after the continued use of alcohol, as a rule not imbibed to the point of producing actual drunkenness, the victim never entertained the intention of drifting into his present diseased condition of mind, and in that respect may again be compared to a true insanity, which might also be due to any other toxic cause. While on the other hand, in crime associated with acute alcoholism, the person purposely takes drinks to stimulate him and "brace him up," so to speak, for the commission of some special act. He uses it intentionally as a means to a certain end. While it may be argued with reason that both are culpable for their conditions, yet in the case of alcoholic hallucinatory mania by reason of the person's unsuspectedness of arriving at a stage or condition making him a dangerous element in the community, should not be held to that strict account they should be, who purposely "load up" to enable them easier to commit a crime.

Conclusive summary:

1. That alcoholic hallucinatory mania is a condition

differing essentially in its clinical aspect from other recognized types of alcoholic forms of disease.

2. That it is toxic in its etiology, and if not advanced to the stage of organic changes, is amenable to treatment.

3. That it is in its clinical aspect a true insanity, and when complicated with crime, should be so considered.

4. That in a given case associated with crime there is not that degree of responsibility that there is in those cases where it is intended to induce an acute temporary alcoholism for the purpose of committing crime.

DISCUSSION

Dr. D. N. Kinsman, Columbus: This is to me a very interesting subject. I am sorry for one thing, the Doctor has limited the discussion to alcoholism. We have many cases that owe that peculiar form of delirium or mental disturbance, shown by hallucinations of sight and hearing, to chloral. I have a case due to the long-continued use of valerian and have seen bromidism followed by the development of hallucinations. These hallucinations are not of the type we have from delirium tremens. Hallucination may and does continue long after the use of these things has ceased, which is not consistent with our idea of delirium tremens. I simply allude to this as showing to me it is the result of prolonged nutritional changes.

The matter of responsibility is a very interesting one. I do not see how it is possible to let the question of irresponsibility arise at all. The man who takes alcohol gets into a condition where he forgets the result of crime, but I do not see how this can in the least modify his responsibility. It was not an hallucination. When a man has hallucinations he may be able to control his will for a time in spite of constant urging to hallucinatory action. He may be absolutely responsible.

Dr. H. J. Herrick, Cleveland: This subject opens to us a broad issue that we can hardly consider in the time allowed, the influence of alcohol on the brain-tissue. I believe alcohol and other narcotics will have an influence on the brain-substance in its working as well as in general nutrition. Any constant over-stimulation causes atrophy. There is a little thickening of the cortical portion of the

neurons and a corresponding atrophy of the part. There is a lack and deficiency of the functions of the brain. Such cases are incurable as a rule.

The point that occurs to me, which we, as sensible medical gentlemen have to consider and pass upon, is, what are we to do with these cases? What are our obligations? The Doctor estimates that 30 percent of mental disturbances are due to alcohol. We know a large percent of other diseases and of crimes are due to alcohol. Now, as sanitarians, what are we to do? It is certainly worthy of the medical profession to inquire as to the remedial agency for this source of trouble to our people. Sanitarians are all agreed it is causing great destruction. We must adopt more potent means for averting the calamities which arise from this practice. I do not know that I have anything to offer to carry into effect the suggestions I make, but it seems to me the Society should take some action looking towards this end.

Dr. L. B. Tuckerman, Cleveland: We are as yet medieval in our treatment of paroxysmal alcoholism. This paroxysm of alcoholism is only one phase of the mental disorder; there are other phases preceding or following and the entire sequence of phenomena constitutes a cerebral disease. Papers like this point us toward a line of rational therapeutics. This, in my judgment, will be confinement in asylums and treatment on the same principles we now treat the insane.

I have a case in mind, a brilliant professional man subject to occasional paroxyms of alcoholism. Previous to the paroxysm there would come regularly, a certain mental condition which I feel now and have felt for a long time, was in the nature of an hallucination. He seemed to think everybody was against him. He was desirous of thwarting those who were working against him. He would call one and another of his friends in and tell how such and such a person was working against him. Once in a while his friends would act on that information only to find the information false. They accused him of lying, but I have felt he was suffering from that class of hallucinations described in the Doctor's paper, so I say, the phenomenon of delirium tremens which we see and appreciate is not the whole of the paroxysm. It is preceded and followed by other manifes-

tations, *viz:* of mental aberration, which often makes the person dangerous to be at large.

Dr. J. A. Thompson, Cincinnati: I have listened with a good deal of interest in several medical societies, to papers on this and allied topics. There is one peculiar feature in these papers. We, as practicians, pride ourselves on learning, first the cause of a disease and then removing the cause. If we recognize typhoid fever as epidemic in a city, we do not urge the building of hospitals for the treatment of typhoid fever, we advocate purification of the water-supply. Whether we consider overindulgence in alcohol as the result or the cause of insanity, there can be no question but that the alcohol aggravates the disease. It would seem, in keeping with our practice, that we should put as the first item of treatment, prophylaxis or prevention. There was a paper read in Columbus three years ago advocating the building of asylums for the treatment of alcoholism and dipsomania. There was no mention of prophylaxis there and none here. I want to close with a conundrum, why is it always so?

Dr. Carpenter, closing: I am not here for the purpose of solving conundrums, but to state conditions. My idea in presenting this paper is that these cases are very common among the general practicians, and still the real condition is not appreciated. They may really be a dangerous element to society. I think these people are often imposed upon because they appear to be well, but are very much diseased persons.

In answer to what Dr. Kinsman said of the pathologic condition in these forms: In those cases that are treated and get well, perhaps the condition is only one of nutrition. The brain-cells are not nourished properly, therefore they will not functionate properly. I think when organic cell-changes have once occurred, there is no likelihood of cure or even of much improvement in the case. I speak of this as being functional; I think that is a bad word. I think it means ignorance very often; means we do not know. Later investigation shows that absolute, positive changes have taken place. I think all chest-cases have a diseased condition of the brain. There is organic disorder.

Dr. Tuckerman: They tried to answer that question in the state of South Carolina, but they have been having difficulty with the United States Courts.

HEAD-NODDING AND HEAD-ROTATION USUALLY ASSOCIATED WITH NYSTAGMUS IN VERY YOUNG CHILDREN, WITH REPORT OF TWO CASES

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Of all the functional nerve-diseases of children few are more rare and none possess greater interest than the rhythmic nodding or horizontal rotary movements of the head, commonly associated with nystagmus. Medical literature makes scant mention of these cases. Some of the books on diseases of children briefly refer to the disorder but seem to confuse the reader by associating it with *epilepsia nutans* or *tic salaam*, which, without doubt, is a true epilepsy.

In 1851 Rhomberg and Henock published the first observations of this peculiar affection that I have been able to find; later Hadden, of London, reported a series of twelve cases, and referred to similar ones; soon after he reported another series of ten cases; lastly in 1892 Peterson, of New York, detailed five cases. Others have reported cases to whom due credit will be given, but the fore-mentioned observers have contributed about all that is known of this curious disorder.

In the very able address of J. Hulings Jackson before the Opthalmological Soc., of the United Kingdom in 1889, occurs the following: "Physicians should try to help opthalmology by bringing forward cases of *spasmus nutans* with nystagamus (a variety, I think of spinal, or rather spinal system chorea, a symptomatic condition akin to canine chorea) would as 'living specimen' interest all of our members." This was said eight years after Henoch's last pub-

lished observations and thirty-eight years since Rhomberg, Henoch, Faber and Ebert had published cases, yet it remained for Hadden, in 1890, to clearly differentiate head-nodding from *epilepsia nutans* or *tic salaam*. And it is to his clear sight that we are indebted for the observation that "There are cases of nystagmus unassociated with head movements the nature of which is hard to explain, * * * some at least of these instances are, in my opinion, fundamentally the same as the class under consideration."

The quotation from Jackson was given not alone for the purpose of calling attention to the confusion existing in regard to the disease but also to serve as an apology for reporting the following cases:

Case I.—E. G., a large, healthy-appearing, breast-fed female, 16 months old; born at term after a short normal labor of a healthy mother. The father is well, but absolutely deaf from a large dose of quinin. The patient has a healthy brother of ten years, who possesses a well-defined rachitic rosary and bowed shins. One sister, two years older than the patient, while under my care died of tubercular meningitis. No other stigmata. Although the child is large and plump, the osteal epiphyses are enlarged and a well marked rosary is felt. The anterior fontanelle is nearly closed and twelve strong teeth have erupted.

The mother says that this is the first sickness of any kind that the child has experienced. It was noticed for a week preceding my visit that it kept turning the head from right to left in a curiously rapid and regular manner, also that it appeared fretful and vomited frequently. On examination I found that the circulation and temperature were normal; the tongue was coated; bowels constipated; appetite good, but without apparent cause it had vomited three or four times in the fore part of the day, to use the mother's expression, "had spewed about a yard." When questioned the mother admitted that the child had tumbled down and bumped its head, to which she seemed to attach little import-

ance, for she added "that it got no more than its share of bumps."

The movements of the head were distinctly horizontal and rotary; they stopped during sleep and were for a few seconds arrested when the attention was strikingly drawn. The sight of my watch stopped them, but in an instant they were resumed, although she continued busy looking at the dial. A sharp whistle had the same evanescent effect. The movements were singularly smooth, easy, regular, and in almost perfect rhythm, and occurred about 72 to 80 times a minute. The excursion began with the chin at a trifle left of the median line and was carried horizontally to the left about 40°, and then brought back to repeat the act. As before said the movement was smooth, easy, and rhythmic without any spasmodic or jerky element whatever.

While observing these gyral movements of the head I discovered a rapid horizontal nystagmus of the left eye, made more distinct or increased when the eyes were directed to the left. From the notes of Dr. William E. Bruner, who at my instance kindly examined the eyes, I quote the following: "Examination of the eyes of E. G. shows a slight convergent strabismus; fixation with the right eye. In the left is a fine rapid horizontal nystagmus slightly more marked, perhaps, when she looks to the left. The outward movement of the left eye is probably limited to a slight extent. The nystagmus is present whether the patient has both eyes open or only the one; the pupils are equal and respond promptly to light and accomodation. The pupils were dilated with homatropin to afford a better view of the fundus, but the child was so restless that I could not get a satisfactory view of the optic nerves and only an imperfect glimpse of the rest of the fundus. No pathologic condition was discovered. It is regreted that my examination does not afford more satisfactory and definite information of this most interesting case."

My unfortunate experience with the elder sister naturally led me to fear some tubercular disease of the brain, but when the tongue cleaned and the vomiting ceased under indicated medical and dietetic measures, this fear subsided and I realized that I had to do with one of these rare cases of gyral movements of the head associated with nystagmoid movements of the eye-ball.

Small doses of iodid of potassium and quite large doses of bromid caused the abnormal movements of the head and eye to cease in less than six weeks. On two occasions during the last six months some slight gyral movements have been observed and at present there are times when a slight horizontal nystagmus can be demonstrated. As time advances a marked outward bow of the legs confirms the opinion that we have present an unmistakable rachitic diathesis.

Case II.—G. L., a fair-sized male child, 20 months of age, the third son of healthy parents, born after a normal labor. The other children are quite healthy except the eldest who was under my care about one year ago, for a mild chorea.

The patient was brought into the Neurological Service at the Cleveland General Hospital in January, 1898. I found on examination beautifully-marked gyral movements of the head, that ceased during sleep and while lying down. Placing the child in a horizontal position without support to the head, the gyrations ceased and only appeared when again placed erect. The movements were momentarily arrested when the attention was strikingly drawn; they occurred about 80 times a minute and were smoothly horizontal, constant and rhythmic.

The eyes appeared normal and without nystagmus until the head was firmly grasped and fixed, when a fine horizontal nystagmus appeared in the right eye, and continued as long as the head was fixed, but ceased immediately when the head resumed the gyrations that promptly followed its

release. No nystagmic movements could be induced by straining the sight to any angle while the child was recumbent. Holding the head in any particular position wh le the child was in a recumbant posture also failed to bring out the nystagmus. The disks were normal, and no weakness or spasm of any of the eye muscles could be demonstrated.

Although the child appeared plump it was pale and flabby with coated tongue and a history of green stools, vomiting and other signs of gastrointestinal disturbance. Two weeks before it had suffered a hard fall from a chair, but apart from a bruise on the scalp no other damage resulted. The fontanelles were a little slow in closing and the eruption of teeth irregular and delayed, yet no rachitic, luetic, strumous, or tuberculous diathesis could be defined.

It had recently recovered from whooping-cough, which was the only sickness that ever demanded the attention of a physician. The case was under observation about eight weeks, at the end of which the movements of the head had ceased but the nystagmus was occasionally observed. I have lost track of the case and am unable to tell in what condition the little patient has been since the last visit to the hospital.

From these two cases a fair knowledge of these cases may be derived, but for the sake of brevity and clearness it will be well to quote the general description that Hadden gives of the disorder in his series of papers on "Head-nodding and Head-jerking in Children commonly associated with Nystagmus." " * * * characterized by nodding or lateral movements of the head, either singly or associated with one another or with movements of rotation. Further, these movements of the head may be almost constant, or may occur more especially during efforts at fixation or during excitement, always ceasing during sleep or when lying down. In most cases there is nystagmus of one or both eyes, vertical, horizontal, or rotary, often occurring

simultaneously with the onset of the head movements, but sometimes preceding them or following them. The nystagmus is much more rapid than the head movements, and has an independent rhythm; it is aggravated by attempts at fixation or by forcibly restraining the head, and may even be induced, when previously absent, by those means."

It would be interesting in this connection, did space permit, to give in brief the comparatively few cases that have been reported.

Study of these cases convinces the writer that no good is to be subserved by dividing the cases of head-nodding and head-shaking into separate classes as one of these movements may replace the other or a combination of both movements be observed in the same case; the most of them are accompanied by nystagmus; occur in very young children; seem to be more or less transient; and appear to depend upon rachitis or some other nutritional vice that renders operative slight irritations, as dentition, gastrointestinal disturbances or, perhaps, a cerebral concussion.

It follows that Peterson's suggested term, Gyrospasm, is not comprehensive enough to include the varieties which our present knowledge convinces us belong in the same category. The term, nodding spasm, as well as gyrospasm is to be rejected for another reason fully as good; they are, in no sense, spasmodic movements, but monotonously regular, smooth, easy and rhythmic.

These valid objections to the descriptive designations under which these cases have been hitherto described, has led me to the use of the title, "Head-Nodding and Head-Rotation Usually Associated with Nystagmus, in Very Young Children," as a more correct description of a peculiar syndrome the pathologic basis of which we are at present ignorant.

Age.—In the majority of cases the disorder occurs between the ages of six and twelve months, although Hadden mentions one at two months, Gee one at six weeks and

Peterson one at three, four and five months, while Henoch details its occurrence in a child of three years.

Sex.—The records show a great preponderance of females attacked.

Character of the movement.—Pure movements of assent like the nodding of "a mandarin doll" are rare; gyral movements are most frequent, although a combination or alternation of the nodding with gyral movements is common. The movements are singularly smooth, easy, regular, and rhythmic, free from the spasmodic action suggested by some of the names, under which they have been described.

In my first case reported the excursion of the gyral movement began near the median line and was carried well to the left. Hadden noted two cases with a like tendency, but the writer is unable to state whether the determination of the head to the side of the monocular nystagmus has any significance.

All movements stop during sleep; in the recumbent posture; and Mills says when the eyes are covered. I find little authority for the latter statement, although I believe it to be correct, at least in those cases associated with nystagmus. It was demonstrated in both of my patients. In both of the reported cases the movements ceased when the child was placed in a horizontal position with or without support to the head. Although in both cases the movements stopped while the child was recumbent in bed, yet as the eyes followed any attractive object the movements of the head were almost ataxic and singularly like those of a very young child whose association-movements were uneducated. If the head was grasped ever so lightly the movements ceased, and no sensation of movement was conveyed to my hands. They were arrested for a few seconds if the attention was strikingly drawn, most observers have made the same assertion, although Mills inadvertently states to the contrary.

Nystagmus.—Nystagmus may be monocular or binocu-

lar; vertical, horizontal, rotary or mixed and alternating—one eye presenting one variety, its fellow another. Hadden says that binocular nystagmus is most common, which statement is open to question, he also states that the nystagmus may or may not correspond in direction to the movements of the head, but study of cases leads to the impression that in purely gyral movements of the head we are more apt to have a horizontal nystagmus, while the pure cases of head-nodding (which are very rare) usually exhibit vertical movements of the eye. Norrie, Henoch and Hadden have recorded exceptions to this rule. Study of cases reveals the interesting fact that most cases of gyral movements of the head were associated with monocular nystagmus. Hadden gives one case of vertical nystagmus of the lids as well as the eye-balls. It is the only one of its kind that the literature affords.

The nystagmus is rendered more marked or, if absent, sometimes brought out by fixing the head; (case 2 illustrates the latter statement) in point of time is usually constant; aggravated by attempts at fixation; and is not modified or inhibited by change in posture. Conjugate deviation of the eyes usually accentuates the nystagmus, and Gordon Norrie of Copenhagen alludes to a case wherein a change in the character of the nystagmus took place when the eyes were turned in certain directions. My cases failed to show this phenomenon. The nystagmus usually precedes the development of the head movements, and often persists long after the latter have disappeared, and may recur without their association.

One of Hadden's cases manifested a persistent nystagmus for one year, after which slight head movements appeared. Case first presents recurrence of the nystagmus during the attact of any one of the many little feverish affections of childhood.

Strabismus.—One of Henoch's cases had a convergent strabismus of the right eye; Hadden reports squint to have

preceded the disorder in one of his patients; Dr. Gee observed the same in one case and it was slightly marked in one of the eyes of my first case. Recent examination shows complete recovery from squint.

Pupil.—Hippus was present in Norrie's case, Hadden also observed one case. Of five cases that Hadden made special examination of the pupils, in adition to the case of hippus mentioned, he records one case with poor pupillary action with convergence; one where the nystagmic eye acted better consensually than with light.

Optic disks.—With the solitary exception of Hadden's case of pale disk with a slight crescent of atrophy about the left, no changes of the fundi have been recorded.

Vision.—The tender age of the reported cases has precluded investigation of the interesting question of the visual acuity. Cases have been followed for years, yet no refractive or other ocular defects have been recorded. From this we would infer that vision is not necessarily at fault notwithstanding Leszynsky's statement to the contrary.

Some of Hadden's cases had a curious way of looking at objects; one turned its head away from the object and looked sidewise; another threw the head back and peered through half-closed eyes. This condition is not necessarily confined to this class of cases, as I have at the present time under observation a bright little boy of two years, that since birth has had a combined double lateral and rotary nystagmus with evident lack of visual power that is made manifest in many ways, but chiefly by looking sidewise with the head turned from the object.

That this peculiar phenomenon is not necessarily a result of nystagmus nor a cause thereof is shown by some notes of a case referred to me by Dr. N. S. Scott.

An hysterical spinster of 29; clothed with the stigmata of degeneration; possessing a family history replete with dipsomania, hysteria, imbecility and lunacy. Muscle-jerks all exaggerated; planter reflexes absent; visual fields contracted

for both form and color; slight horizontal nystagmus with extreme conjugate deviation of the eyes. She has rhythmic rotary movements of the head, and when she desires to look to the extreme right is compelled to turn the head to the left. This case has been regarded as hysteric, yet we must admit that the peculiar association of head movements, nystagmus and conjugate deviation of the eyes and head from the object viewed, is at least suggestive.

Relation to Epilepsy.—Dr. Gunn who examined many of Hadden's cases, suggested an alliance of these cases with epilepsy, and the latter was disposed to believe in the existence of the relation. Both of these observers witnessed a temporary abeyance of conciousness in two of the cases, neither of which, however, had a family history of convulsive disease. Out of a series of twenty-one cases observed by Hadden six yielded a family history of convulsions.

In case 3 of Hadden's the child was subject to sudden outbursts of convulsive laughter. He seemed to think, as did Henoch, that these paroxysms of uncaused glee were, in a way, related to epilepsy.

None of these cases have, as is the usual course of the early minor manifestations of epilepsy, gone from bad to worse or even developed a genuine case of the Sacred Disease. Unlike epilepsy the tendency has been toward cure and no case has been recorded that did not recover.

The writer believes that the fact contained in the last paragraph disposes of the contention, which is obviously based on a paucity of observation and fact.

Exciting Causes.—Henoch and other observers were quite sure that dentition was the chief exciting cause, and as the majority of the reported cases have occurred during that erethistic period of child-life, it certainly merits consideration. Hadden was disposed to recognize its claims, but broad-minded enough to confess mental reservation. Peterson's cases failed to impress him with its importance as a causative factor, and as one of his cases began at three

months, one at four months, one at five, one at six and one at seven months, we must recognize his doubt as natural and conservative. And since Hadden, Gee and Peterson have observed cases at one and a half, two, three, four, five and seven months, and Henoch at three years, we must confess, notwithstanding the occurrence of our cases in the period of dentition, that it is best to reject dentition as anything but a predisposing cause such as it undoubtedly is in a large number of the ailments of childhood.

Rickets and other nutritional disorders have been observed in connection with the disorder with enough frequency to merit our attention. Undoubted rickets was observed in nine cases of Hadden's series of 21 cases; and is markedly present in my first case. Neither Peterson nor Henoch mention it. Most observers have referred to gastrointestinal irritation as a cause, and certainly my cases point to this as a factor.

Traumatism is by Hadden carefully considered and recognized, while Peterson, Hersch and others regard it as the most potent of all exciting causes.

We must consider before we accept these causes as bonafide ones that in the dispensaries of London where Hadden observed his cases, that rickets is the most common of all diseases of children; and that history of falls and bumps are but daily histories of children. Hadden reported three instances of head injury in his first series of cases; Peterson, in two of his five cases; Hirsch, in his single case, while in case first it was doubtfully present, in the second it was undoubted. Peterson says, "Perhaps concussion of some kind may be found in most of the cases to be the determining factor—a concussion setting up, in the centers of the spinal accessory and at times in those of the oculomotor nerves, an arhythmic discharge."

Pathology.—The pathology of functional diseases that possess inherent tendency to self-cure is quite sure, for some time to come, to rest upon a basis of analogy rather than his-

tologic fact. And the time is also come when we no longer look to the microscope as the last and final court of appeal, for with the advent of the latest pathologic science we are convinced that through the wonderful lenses we see but the ashes of the perished fires. And while speculative pathology is not to be encouraged, yet the shrewd clinician is the man of all men to point the investigator to the seat of the disease. Henoch was prompt to suggest an irritation at the roots of the spinal accessories, upper spinal nerves and *motor oculi communis*, which demanded a nearness of origin, of which the knowledge of that time afforded scant proof. To the comprehensive grasp of Hadden we are indebted for suggestions that, the writer believes, throw the best light on an obscure subject. "* * Hadden believes that the seizures point to instability of motor-centers above the nuclei in the spinal cord and fourth ventricle, and he would therefore attribute the disorder to a functional or other disturbance of the cerebral cortex. The child has acquired certain voluntary or purposive movements of the head and eye-balls, but these have not as yet become thoroughly organized and fixed in the psychomotor areas of the brain; hence a dissolution takes place because of the inability of the strained cortical centers to stand the work to which they have been too early subjected." (Mills).

The writer in considering the pathology of these cases accepts as a fact the obvious relation of the head and eye movements; hence we have to consider an automatic head and eye movement in a child of unstable nerve-development, and at an age in which the association of those necessary movements is being educated and fixed in the psychomotor areas of the brain. Anyone that has observed the head and eye movements of the infant cannot have failed to mark the incoordinate attempts at associated movements of the head and eyes.

The fibrous connection between the visual areas of the cerebral cortex and the *fovea centralis* that is necessary to

perfect vision, does not fully develop until after birth, and only gradually becomes medullated and fit for function. After this process is completed, which takes place only when the cortical cell has attained a degree of maturity that provides an ample nutrition for its axis-cylinder, then the structural and physiologic integrity of the central neuron is complete. During this time the same process of development in the peripheral neuron is going on with even greater rapidity, and we have the beginning of one of the most wonderful and mysterious processes of the nervous system—the communication between the central and peripheral neuron.

Binocular adjustment, judgment of fixed objects, spacial relations including station are acquired by the child as the medullation progresses. If this process of medullary development of the nerve-supply of the eyes is interfered with either by disturbance of nerve-nutrition or rendered functionally imperfect through early acquired opacity of the refracting media, or by congenital absence of a place in the retina that has more acute and perfect vision than elsewhere (*fovea centralis*), or a congenital defect in the receptive center in the cortex, or an exhaustion of any of that delicate apparatus, then we are liable to get a rapid too and fro movement of the eyes—*nystagmus*.

Nothwithstanding the statement of Leszynsky, the majority of these children have not defective vision but develop nystagmus as a result of either cortical exhaustion or a disturbance of the conducting powers of the fibers; hence all of the impulses sent from the cortical cells to the muscles are either too feeble to reach their destination or are blocked by imperfections of the transmitting tracts, and we have a real corto-ocular paralysis agitans.

When we consider that a severe concussion may so disturb the cortical cells of a healthy adult as to produce a rapid though transient nystagmus we cannot logically reject traumatism as an excitant of a more widespread and

permanent, though like condition in the unformed nervous structures of the infant.

If the relation that the ordinary head-wagging of the child with congenital nystagmus and that of paralysis agitans is due either to cortical exhaustion or disease or defects in the medullation of the conducting fibers, we need not puzzle ourselves unduly over the association of the automatic movements of the head and eyes of infants as described in this paper. For any child affording the constant irritation of rachitis and other nutritional disorders; of an unstable, unformed nervous system; spurred to its full capacity by the untiring energy of childhood, is it a wonder that cortex and conducting paths become exhausted and take on an erethistic sensibility which any slight excitation—indigestion, fright or a slight concussion, may set up irritative discharge of automatic nerve-force that finds expression in the monotonous movements of the head and nystagmic twitching of the eyes, simply because they represent the highest development of the acquired association-movements that the child is busily educating for the proper preservation of the highest type of animal life.

Diagnosis.—The question of diagnosis is one of examination. Study of the reported cases along with my own limited experience convinces me that the imperative movements of the mentally defective and imbecile are easily differentiated.

The spasmodic twitchings of epilepsy, the incoordinate, jerky, purposive movements of habit-spasm and chorea, essentially differ from the monotonously smooth nodding and gyral motions that are characteristic of the disorder under consideration.

The peculiar head-wagging noticed and admired as cute and pretty in precocious children when intensely interested approaches the disease and indicates an actual strain of the association-tracts. The wabbly rolling heads of children with congenital nystagmus, vainly trying to fix head

and eyes by the aid of a poorly endowed visual center, either at the retinal or cortical end of a very complex and delicate connecting tract, bears some resemblance that the history alone will dissipate.

The "head-banging" of Gee, in which young children turn on their face during sleep and bang the face into the pillow a number of times; and "head-knocking," which in London is so often seen as a symptom of rickets in very young children, in which the little one seems earnestly happy while knocking its head with considerable force against some hard substance, are so totally unlike the preceding cases that one who has read the carefully accurate descriptions of Gee and Hadden cannot fail to make a correct diagnosis.

Prognosis.—The prognosis as regards life is good; no fatal case has been reported. Most cases tend to spontaneous cure in six weeks to three months, but many cases have a tendency to relapse if the child suffers any disturbance of health. Hadden observed one case that remained well for a period of two and a half years and Gee's first case was found to be well and strong at the age of twelve years. While Hadden observed some slight mental deterioration, he was of the opinion that it would not persist.

Treatment.—The treatment that has seemed to expedite recovery is in itself an argument in support of the cortical exhaustion theory; nerve-rest by bromids; rest and increased nutrition of the brain by the recumbent posture. If the child is cachectic study the cause and remove it, be it struma, lues, tuberculosis, or rachitis. Quite a percent of the cases seem to have rachitis, and unless this condition is carefully sought and treated by diet, phosphorus and lime you will not have done your whole duty. Most painstaking and thorough should be your investigation of the digestive system and correction of all its errors. Judicious warnings to parents of precocious children, urging them to forbear the exhibition of the unnatural brightness of the tender

little mind, and to protect them from traumatism, as these children seem to be prone to fall because, as I believe, they are slow to acquire spacial and posture judgment.

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CHAPTER VII

GYNECOLOGY

MONSTROSITIES VS. MATERNAL IMPRESSIONS

BY GEORGE S. COURTRIGHT M. D., LITHOPOLIS

In presenting a paper to the Society on this subject, I will not enter into either the history of, or the speculations offered for, the abnormal conditions found in these cases, or give the history of all cases I have seen, but will condense in a very short article a case of more than ordinary interest to me, and of which I have not seen a duplicate in the published literature to which I have access, *viz: Three* monstrosities in *three* consecutive pregnancies.

Mrs. S——, aged 21 years; robust; full figure; weight, about 160 pounds; above the average height; was married January 30, 1888. Her husband is of medium height and weight. Occupation, teacher. No indications of venereal disease in either husband or wife.

Mr. S., while running a traction-engine on the public highway, April 3, 1888, was severely injured by having one foot caught in the cogwheels, tearing the integument and muscles from the heel, back part of foot, lower part of leg, and injuring the *os calcis*. He was taken home, medical aid summoned, and an effort made to save the foot without removing any part of the bones. I did not see Mr. S. after the accident until June 18, 1888, when I removed some dead bone from the *os calcis*, and then learned that his wife was very much frightened when she heard of the accident and the subsequent attention given her husband, as she was his constant nurse and attended to the dressing of the injured

foot. During the summer of 1888 Mrs. S. suffered with a constant fear and morbid feeling that her child would be deformed. Aside from this morbid impression nothing unusual occurred during gestation.

The wound healed very slowly, partly by granulations and later by skin-grafting after removing dead bone from the *os calcis* several times by other physicians, but was not entirely healed until June, 1893.

September 25, 1888, Mrs. S. was delivered of a child—female; apparently full term of gestation; well developed, except the following malformations, *viz:* one-half of the superior part of the occipital bone was absent, giving the head a flattened appearance, from behind forwards. Left eye-ball entirely absent; the orbital cavity partly filled with cellular tissue. Right eye-ball completely outside of orbital cavity and attached by some connective tissue to the lower eyelid. The whole eye-ball had a very black or discolored look. Both legs were very short, not over one-third the length of a child of its size. The child after its birth made two or three feeble gasps, but no respirations occurred. Convalescence rapid.

July 27, 1889, was again called to attend Mrs. S. in labor. Membranes had ruptured before my arrival. Foot presentation; labor somewhat tedious; child dead; with the following malformations, *viz:* Left side of the head, both the frontal and parietal bones, greatly flattened; in fact, so much so that there was no room for any brain matter. Occipital bone partly absent and the brain matter that should have occupied the left side of the head was pressed back through the absent occipital bone, forming two well-defined tumors, one the size of a large hen's egg and the other the size of a goose-egg. The contents of these tumors were connected with the brain matter contained in the right side of the cranium. Both eye-balls were in the orbital cavities, but nothing but a very slight discoloration to show any cornea, and no pupil present in either eye-ball. Four small

tumors on the tongue. Each hand had six fingers or five fingers and one thumb. Legs very short. Each foot had six well-formed toes, and all very long, quite as long as the fingers; on the left foot the great toe stood away from the rest, very similar to the thumb separated from the fingers in the hand. Nothing unusual occurred during convalescence, which was rapid.

On May 23, 1890, was called to visit Mrs. S., who, I found, was again *enciente*, and was suffering with uremic convulsions. Face, hands, legs and feet greatly edematous; had had convulsions before my arrival. Under treatment there was no return of the convulsions, and labor came on June 17, 1890. Found foot presentation; no trouble in delivery, until the head presented, which gave considerable trouble, and was found to be a hydrocephalic head, with the occipital bone entirely absent and the largest part of tumor at this part. Measurement around this tumor at the back part of the head next to the neck was fourteen and one-half inches. From the base of the nose between the eyes to posterior or lower part of tumor, over top of head, was fifteen inches. Total weight of child with head, six and one-half pounds; weight of head with tumor, four and one-half pounds. The body, well-formed, with a rudimentary penis, had six fingers, or five fingers and one thumb, on each hand, and six toes on each foot. I might add that none of the relatives, either on the paternal or maternal side, have a redundancy of fingers or toes.

As the parents seemed very anxious to have a well-formed living child, and as these three children were all born within twenty-one months, *viz:* the first September 25, 1888, being five months and twenty-three days after the husband was injured; the second, July 27, 1889; the third, June 17, 1890. I gave it as my opinion that if Mrs. S. did not become pregnant again for four or five years she might have a healthy, well-formed child.

Mr. S. and wife accepted positions as teachers in a well-

known reformatory near Philadelphia, Pa., and I heard nothing further from them until I received a letter from Dr. Eckman of Philadelphia, dated November 18, 1894, saying that Mrs. S. was pregnant, and asked me to give him a brief history of her case and the advisability of interfering in the present pregnancy by inducing premature delivery. I wrote him briefly what I have stated, and said: "I would not advise any interference in the case unless uremic convulsions came on."

Mrs. S. some time after this came to Ohio, and I am told she was delivered June 8, 1895, almost five years after the birth of the last deformed child, of a healthy, well-formed male child, and learn from Mrs. S., April 7, 1898, that they "have a fine intelligent boy."

The question is, did the fright and care of the disabled husband produce the condition found in the first child? And did the morbid fear and early conception in the two subsequent pregnancies produce the conditions found in the two latter? My opinion is that such was the case.

HENROTIN'S METHOD IN PELVIC ABSCESS.

BY J. C. REEVE, Jr., M.D., DAYTON

It is not the intent of this paper to plead for the vaginal opening of pelvic abscesses. That has been the practice to a certain extent for a generation, and of late has become even more firmly established, and adopted for an increasing number of conditions.[10, 11, 12, 13, 14] The purpose is rather to point out to the general practician how such abscesses may be easily and safely opened by a new method; and to the general practician this should certainly be of interest, since many men not surgeons are in the habit of incising or aspirating such collections—many, compelled to depend on themselves, must attack them in some way.

Later methods in surgery have accumulated so rapidly

and have come from such a variety of sources, there are so many workers in the field, that it is hard to accredit to all the deserving ones the successive steps which make up a new procedure. And so in this operation, which has been called Henrotin's. But certainly he deserves most praise, at least in this country, for repeatedly calling attention to its merits and pointing out its scope.[5]

The plan is this: Steady the cervix by volsellum forceps and incise the vaginal mucous membrane at the cervicovaginal junction either just behind or just in front of the cervix, avoiding the sides of the cervix for obvious reasons. The anterior or posterior fornix is selected according to its respective nearness to the collection to be reached. After cutting through the membrane continue the dissection bluntly by means of the finger or of the closed blunt scissors, adhering to the middle line of the uterus as in hysterectomy. By keeping thus against the firm tissue of the uterus one cannot go astray and is on safe ground. After getting quite above the cervix it is then safe to go straight to the objective point provided the dissection is done with the finger, aided by counter-pressure by the other hand through the abdominal walls. After the fluid is reached the channel can be dilated, or if this does not enlarge it sufficiently a vertical incision in the middle line can be added to it, reaching short, of course, of the rectum or bladder. The cavity can then be packed or drained with a tube. It is the custom of the writer, especially when there is much odor, to place a two-way tube, made by stitching two large rubber tubes together. The smaller, carrying in the solution, reaches to the top of the cavity; the larger drains its lowest parts. Both reach outside the vagina and so permit of frequent irrigations (of mild antiseptics) with no disturbance to the patient or attendant, and sometimes requiring not even a bedpan.

How different is this from some methods in the past! The tortuous channel made by self-evacuation, and the small

opening of the aspirator or bistoury, led to months of hectic or pyemia, which eventually brought vaginal routes for pelvic drainage into disrepute. With the improved method the procedure was naturally extended to other purposes; in fact, to most all fluid collections within the pelvis. Some are warm in advocating the evacuation of ectopic pregnancy of an early date by a similar course.[1, 2, 4] Collections thought to be adherent pyosalpinx or hydrosalpinx have remained cured after thorough drainage by this method,[3] and by continuing the dissection a little farther, the peritoneum can be penetrated, and circumscribed peritoneal collections evacuated. The same incision has enabled Ross lately to cure a posterior rupture of the uterus.[9] Henrotin has pointed out the great advantage, that if no pus be found in a case of pelvic inflammation, there is no harm done, but on the contrary, a benefit from the drainage of blood and serum; this having the same influence for good that early incision has upon an external cellulitis. Further, if no pus be found the opening permits often of a thorough exploration and hinders in no way a celiotomy at the same or a subsequent time.[6]

The value of this procedure, where other conditions are mistaken for abscess and cellular effusion, is shown by the following cases, briefly mentioned:

A negress, acutely sick, was operated upon for a pelvic abscess. Upon opening it, it was found to be a suppurating dermoid. The contained teeth and "switch" were removed and a double drain placed tentatively. She found herself afterwards so well that she would have nothing more done and wore for seven months a small drainage-tube. At the end of that time, however, better counsel prevailed and she permitted the tumor to be enucleated through the same incision, a procedure of but moderate difficulty, the sack having now contracted to the size of a large fist. She was then in a few days well.

Five days after the sudden appearance of an hemato-

cele in a young married woman the same was punctured, probably under the impression that it was an abscess. Serious hemorrhage continued from the cavity for eleven days, when the opening was combined with one of the kind under discussion and a great many clots and placental remains from an ectopic pregnancy removed. To control hemorrhage it was necessary to repack the cavity several times during the next several weeks, but her recovery was not otherwise interrupted.

Six weeks after a young woman's confinement, fever and pelvic inflammation developed and a small movable tumor was found in the pelvis, supposed to be a pyosalpinx. Upon reaching it by vaginal dissection and evacuating it, it was found to contain clear fluid. Final diagnosis: a previously existing hydrosalpinx with a transient pelvic cellulitis. Drainage promptly affected a cure, which has remained for four months.

An anal fistula had resisted several operations, and at a final one a thorough search was instituted for some ulterior source of the discharge. A tumor larger than a hen's egg was found between the uterus and rectum. It was reached by vaginal incision but found to contain clear fluid, being probably a cystic tumor of the ovary. Drainage by packing cured the cyst.

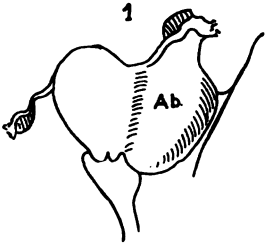
It will be seen that I am a believer in pelvic cellulitis and in its extension to suppuration.[11, 14] Why I have never doubted such it is not necessary here to state, further than that I have twice opened the abdomen after evacuating pus through the vagina and have found tubes, ovaries, etc., entirely undistended.[8] In the great majority of cases pus in the pelvis is within or below the broad ligament, and the accompanying diagrams, taken with slight alteration from the *Archiv fur Gynecologie*[7] will show this so clearly, as well as several points in connection with our subject, that it has seemed well to present them. They are not imaginary cases but have been demonstrated by their authors. No. 1

shows an edematous swelling extending from the cervix or body, between the folds of the broad ligament; the uterus is displaced downwards and the *fornix vaginae* bulges.

The connective tissues in front of the uterus may suppurate (No. 2); then the peritoneal covering is raised and the pus burrows upward behind the anterior abdominal wall, pushing the uterus and bladder downward and backward, and may escape at the navel. In No. 3 the inflammatory process starts between the cervix and rectum, causing the Douglas culdesac to bulge downwards, and sometimes an edematous rectocele to appear. No. 4 shows several small separate exudations situated in the broad ligament, and No. 5 a more advanced stage of the same. They are particularly annoying to the surgeon because, after one or more are evacuated, or after one or more compartments of the multilocular abscess are evacuated, others are overlooked or form later, causing a continuation of symptoms most discouraging to all concerned in the case. Several long cases of violent pyemia I have seen from this cause, one lasting three and a half months. The latter, however, as indeed most of them, ended in recovery.

From within the broad ligament pus may burrow to the side, upward under the peritoneum, covering the psoas muscle, finally reaching the ribs. A chronic puerperal abscess of this form, No. 6 and No. 2 combined, the writer has met, reaching from behind the liver and under the diaphragm above, to the trochanter below, the contents being pus and gas. No. 7 shows an abscess of long standing, where there has been a thickening of the walls by gradual deposit upon them.

In all these forms of abscess I have used the above-described incision, and it forms the best channel to them, unless, of course, there is external pointing. That it is still little used, though before the profession now several years, is shown by the invention lately of two forms of specially-devised aspirator or dissector for opening pelvic abscesses.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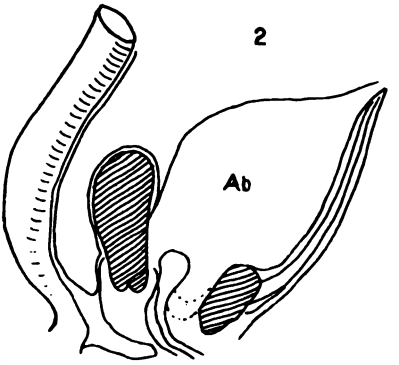
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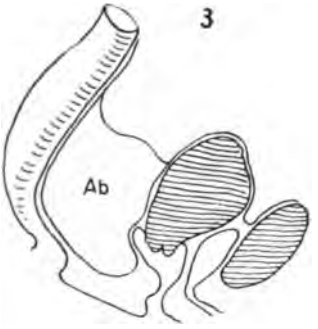
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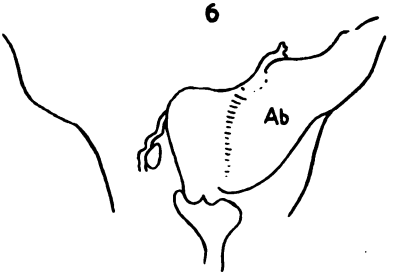
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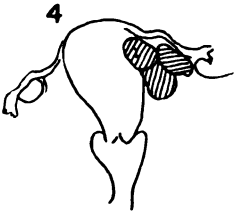
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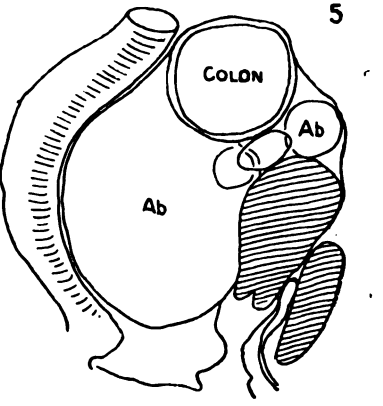
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These are uncalled for, since they can be neither so safe nor effective as blunt dissection.

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DISCUSSION

Dr. C. L. Bonifield, Cincinnati: This is a very interesting paper and deals with a subject important to gynecologists. The cases that test our skill are the cases of pus in the pelvis. The method the Doctor has described is certainly valuable in a limited number of cases. Several years ago I adopted this method in nearly every case that came into my hands. I soon abandoned it for all but exceptional cases. Where we have a very large accumulation of pus in one cavity, this is the operation *par excellence,* but this condition exists in a very small minority of cases. On more than one occasion I have made this incision and drained a large quantity of pus. The patient improved for a few days. I drained another cavity but finally had to end with a celiotomy to cure the case. I had one very unfortunate result. I opened the culdesac, evacuated a large quantity of pus and expected my patient to do better. Her temperature immediately went higher, and there was every evidence of shock and collapse as seen after the rupture of a tube or an appendix. I did a celiotomy the same afternoon but the patient did not rally from the shock.

The trouble about this method is that we cannot tell how many cavities of pus we have in the pelvis. It is not limited to the broad ligaments, ovaries or tubes. You will find it in many other places, particularly between coils of intestines that have become adherent to one another. I cannot im-

agine anyone so dextrous as to be able to drain all these places from below. Only when I can assure myself before beginning to operate that it is simply one abscess, or when the patient's condition is so bad, that I believe it must be improved by the evacuation of some of the pus before she can endure a radical operation, do I now attempt to operate through the vagina. In all other cases I open the abdomen, making a free incision and employing the Trendelenberg position in order that I may see, as well as feel, what I am doing.

Dr. J. F. Baldwin, Columbus: I think the method that has been popularized in this country by Henrotin has given us a distinct advance in the treatment of these pelvic abcesses. I think the more a man uses this method, the more skillful he becomes and the more pleased he will be with its use. Mortality records must be the ultimate resort by which to judge the utility of an operation. I am certain a surgeon who has had some experience in these cases will attain better results than if he opens from above, especially in acute infectious cases. Take a case where the pus is practically sterile, we can open from above, clean out everything, and the patient recovers. But take an acute case, the escape of even a little of that pus will develop peritonitis and we have a bad result. I have used this method in many of these cases. I open all the cavities, put in one or two drainage-tubes, pack with gauze and see my patients recover Had I operated from above, it would have been with greater difficulty and I feel sure I would have had worse results. Surgeons who have such beautiful statistics pronounce these cases "inoperable" and so preserve their statistics. In virgins, in whom we see many of these cases, the vagina is small, still I think this is the safest way to cleanse these cavities. Of course, a man cannot plunge in. If one is working in front, free incision should be made and the ureter pushed away or we may wound it. Under profound anesthesia, with due precautions there is very little risk of going into the pelvis from below.

In my experience the results have been very much better than by the other method. The method does not apply to all cases, but to a very large number, especially to tubal rupture with hematocele. I cleaned out a case in a married woman the other day. I could pass my fingers up almost

high enough to reach the umbilicus. I do not think the woman was in the hospital more than ten days.

Dr. Edwin Ricketts, Cincinnati: There is no doubt there are cases best dealt with through the combined method. What goes to make up pelvic abscess? Where is it located? Is it the result of a pyosalpinx? Is the pus in the ligaments? In the tubes? In the uterus? In the wall of the uterus? Or is it behind the ligaments? I wish to refer to a case reported to the Cincinnati Academy of Medicine. Following the birth of the second child there was indication of pelvic abscess. There was distension of the bowels; the uterus was fixed; there was a mass on the left side; a diagnosis of peritonitis was made. The question came, where is the pus located? In the tube, the uterine wall, or external to the uterus? I decided to open the abdomen, for incision of the peritoneum under such circumstances is always a step towards cure of the peritonitis. Nearly a pint of fluid, not pus, was removed. The left ovary and tube were adherent. No pus in either tube. Examination of the fundus of the uterus showed the abscess to be located in the left wall. I forced the uterus down into the vagina and was able to get at it and drain out nearly two ounces of nasty pus. I was glad the Doctor spoke of how far up you could get the fingers. I had the peritoneum over the finger. The uterus was packed. Ten days afterwards, a hard catheter was carried into the abscess cavity and a teaspoonful of pus drained out. I made the fight of my life to get this patient through. She is now sitting up. I felt it was as necessary to open that abdomen as it was to release the pus from below.

Dr. Reeve, closing: It is a point to decide which route to take; that I did not touch upon in the paper. My subject was this method from below. It is not the makeshifts of three years ago. At that time, the method I have described, was not invented.

ECTOPIC GESTATION: WHAT CASES TO OPERATE UPON

BY J. AMBROSE JOHNSTON, M. D., CINCINNATI

To those who have not had much experience with ectopic gestation—an opportunity given only to the few—its treatment is confusing when on the one hand an array of writers advocate the arrest of the developing ovum by electricity, and when on the other hand equally qualified men insist upon opening the abdomen in every case. Consequently the general practician seldom cares to give a decided opinion in these cases and usually refers to the abdominal surgeon for advice as to the necessity for operation. But the "individual dictum" of the surgeon ought not to settle such a question; many surgeons have great experience in operating upon ectopic-gestation cases and little experience in watching the course of, especially, the extraperitoneal rupture uninterfered with.

The general impression is abroad that every case of ectopic gestation, no matter when seen or what the conditions are, demands celiotomy on the general surgical ground that an opened artery must be ligated, and forgetting that the ruptured vessel is very frequently located where its output is soon limited by the surrounding tissue, thus bringing pressure to bear on the ruptured vessels. It is this idea that I protest against in this paper, and in order to do so we shall take up the various stages of extrauterine gestation.

Prior to rupture, if one is sure of his diagnosis or if only sure of gross disease of the Fallopian tubes immediate celiotomy is to be commended. The operation would be less dangerous than the complications that are sure to come later. But when we come to consider the difficulties of making a diagnosis, this advice will seldom be acted upon. One is seldom aroused to the fact that a patient is the victim of an ectopic gestation until symptoms of rupture begin.

Women rarely call upon us in the early months of pregnancy to relate their symptoms which are common to both intra- and extrauterine pregnancy. Not until signs of rupture intervene or rupture has occurred, as a rule, is the physician consulted. Even if a case presents itself with cramp-like pains indicative of impending rupture of an ectopic-gestation sac, how difficult is it to say that the uterus itself is not pregnant if the patient has thick abdominal walls which forbid a satisfactory physical examination. How embarrassed one would feel if a diagnosis of ectopic gestation is made and a celiotomy reveals an intrauterine gestation! Lawson Tait says: "The strangest thing to me is that, in the enormous experience I have now had in tubal pregnancy, I have never but once been called upon to make an examination until rupture occurred, and in that case there was neither history nor symptoms which enabled me to do more than to determine that there was tubal occlusion."

With the evident difficulties and with such testimony as a man of Lawson Tait's experience, no one can doubt but that he will rarely see a case of ectopic gestation before rupture takes place and therefore will not have to worry about the advisability of doing a celiotomy.

After rupture is the time, as a rule, one is called to these cases, and the gravity depends largely upon whether the rupture is into the broad ligament or into the peritoneal cavity.

If the break is into the broad ligament the case can be looked upon favorably. It has been my experience to see several cases of extraperitoneal pelvic hematoma preceded by symptoms indicative of ectopic gestation yet none of them were operated upon and all got well.

In 1891, H. T. Byford (*Amer. Jour. Obst.*, vol. XXIV, p. 1296) said: "The first considerable hemorrhage nearly always kills the fetus and but seldom kills the mother." In discussing this subject Newman (*Amer. Jour. Obst.*, vol.

XXV, p. 79) said: "Nature has thrown around the reproductive organs safeguards that I believe will protect women in a very large percentage of cases."

An extraperitoneal hematoma will absorb in about the same time that a patient will convalesce from a celiotomy, with no more danger of infection, and without the liability of results that sometimes follow celiotomy. Certainly such cases situated where they cannot have the attention of a surgeon experienced in abdominal work, together with qualified assistants and accessories are better off if uninterfered with. How frequently do we hear case-reports where the fetus could not be found in a handful or two of clots shelled out of the broad ligament and no hemorrhage into the general peritoneal cavity!

If, in the early months rupture takes place extraperitoneally, an operation, as a rule, is not required unless the fetus continues to develop or symptoms arise indicating that the hematoma has become infected. Simply to operate for a hematoma following symptoms indicative of ectopic gestation is hardly the right thing to do, especially when the pulse and temperature are about normal.

After rupture into the peritoneal cavity, many cases bleed so rapidly that the patient is beyond all earthly help when the physician arrives.

When symptoms of ectopic gestation have been present, when the pulse becomes gradually accelerated and grows weaker, when the respiration becomes more rapid and air-hunger so prophetic of severe hemorrhage gradually comes on, when vertigo. and nausea are present—these symptoms taken with a boggy sensation detected in Douglas culdesac point strongly to intraperitoneal hemorrhage and demand that celiotomy be done without delay.

When some few weeks after rupture life in the fetus is made certain, it is proper and right to remove the developing product. No sentiment in behalf of the fetus should deter one from operating as soon as proof of further devel-

opment is acquired, because, even if the fetus is carried to term, it, as is usual in these cases, is likely to die soon after birth; then to prolong gestation is to daily add to the mother's increased danger from hemorrhage and septicemia.

Calcified, mummified or saponified fetal products often remain for years without giving trouble and should not be interfered with unless some disturbance to the general health intervenes, then celiotomy is called for.

DISCUSSION

Dr. R. B. Hall, Cincinnati: This is an exceedingly interesting subject. Intimately as I know the essayist and his work, I want to take issue with some of his statements for I feel they put a false light on some very important points. The gist of the paper depends upon the correctness of the diagnosis. Extraperitoneal rupture of tubal pregnancy is rarely found on the operating table, but it is not one of the rare conditions found by the clinician. We wonder why the discrepancy? Evidently someone is mistaken. At the clinical bed we very frequently find external or subperitoneal hematocele with tubal gestation. At the operating table, scarcely ever. If the hemorrhage is small and the patient gets well, the clinician is confirmed in his diagnosis. Price says in hundreds of operations he has never seen a case of extraperitoneal rupture. Tait says it is of extreme rarity if it ever occurs. With the statement of these operators before us we must believe it is rare. Compared with these two gentlemen I have made a very small number of operations, but I have operated often enough to be convinced that it is rare. I have in mind three cases of supposed extraperitoneal rupture, so diagnosed by three of the most distinguished men in my city. They thought they could not be mistaken. There was a tumor extraperitoneally and every prospect of a happy termination of the case. One in particular, the Doctor was so certain ne promised the case was practically well, and he was honest. She grew suddenly worse. Diagnosis was bleeding in the peritoneal cavity. I operated, but she did not recover. Practically, all the blood she had was in the abdominal cavity. It was never extraperitoneal. At first there was a small hemorrhage and she bled slowly. Had she been operated on

then, she would have recovered. The other two cases were very similar. There is reason to doubt that the cases treated for extraperitoneal rupture followed by recovery without operation, ever were such. Many cases that rupture do get well without operation, but it is an exceedingly dangerous doctrine to believe. If we were to assume in every case that the rupture was into the peritoneal cavity, the patient would be much safer. As soon as we make a diagnosis of tubal pregnancy, I believe it is best to operate at once. If there is extraperitoneal rupture we put her in a position where she will get well for we stop the bleeding. I remember a case of supposed extraperitoneal rupture so treated. When finally operated on, it was proven never to have been extraperitoneal. Many of these cases treated expectantly are in great danger from another cause. The blood-clot is not always absorbed without danger. After three or four weeks, the temperature suddenly rises. The patient is suffering from acute sepsis from contamination of the blood-clot. You lose your patient. This is not imaginary. The wife of a Doctor operated on five months after rupture, got well after weeks and months of sickness from previous infection. There was a sinus remaining for two or three years from infection of the ligature. To control the hemorrhage you are obliged to place the ligature in this nasty blood-clot, then there is bound to be a sinus.

Dr. D.Tod Gilliam, Columbus: Dr. Johnson's paper is a good one; logical, conservative, but I fear not a safe guide for the surgeon. The doctor says that many cases of extrauterine pregnancy will get well if left alone. With this I am in perfect accord. If the doctor will tell us just what cases will get well without interference, and how we are to recognize them, I, for one, will gladly follow in the wake of his conservatism. We all know and have known for a long time, that extraperitoneal cases were much less dangerous than others, but how are we to distinguish them? When Price claims that he seldom or never encounters an extraperitoneal case, and Tait, on the other hand claims that they are common; what is the inference? Simply that one or the other is mistaken. If such men can be mistaken how will it fare with the average surgeon? The ordinary physical signs of intra- and extraperitoneal rupture are entirely inadequate and often misleading. The groined arch of the

pelvic roof is no more to be depended on as indicating extraperitoneal rupture, than the convex protrusion into the vaginal vault unerringly indicates intraperitoneal rupture. Even when we have entered the peritoneal cavity and have the parts under the finger and eye, we are often at sea as to the question of intra- or extraperitoneal situation. This is evidenced by the discrepancy between Tait and Price. It is evidenced by the frequent experiences of every abdominal surgeon. I will cite a case in point; not that it is rare or unusual, but because it happens to occur to me at the present moment. Some years ago an actress applied to me for relief for pelvic trouble. She was suffering from non-suppurative salpingitis. After breaking up adhesions I concluded not to remove the appendages. Some months after, while acting in St. Louis, she was taken violently ill and sent to the hosiptal and fell into the hands of one of the most experienced abdominal surgeons of that city. He opened the abdomen, but finding neither tubes nor ovaries, and thinking, perhaps, that these had been removed at the former operation, closed her up again. The parts had been snowed under and glazed over so that he was led to suppose that the troub.e was in the broad ligament and extraperitoneal. He so stated it to me in a letter. Six months afterward I again opened the abdomen and removed the appendages and she recovered immediately. There are conditions in which the exudation becomes covered with a surface so similar in appearance to the normal peritoneum, that I defy any man to distinguish between them except by microscopic examination. The doctor contends that we should not operate on cases not attended with alarming symptoms. With this suggestion I am obliged to take issue. The dangers of an operation for extrauterine pregnancy are in direct proportion to the inherent dangers of the case itself. In a simple, uncomplicated case the mortality rate is practically nil. In cases that are complicated and involved, the dangers of operation are proportionally increased. These cases would die if left alone, they run the risk of dying if interfered with. As we cannot definitely differentiate between an intra- and extraperitoneal ectopic gestation, as one may become converted into the other, as the age of an extrauterine pregnancy has everything to do with the operative results, as the dangers of procrastination are so numerous and grave, and, to cap it all, as the results

of early operative interference are so uniformily successful, I think we err in leaning to a conservatism that must eventuate in a material loss of human life. I even go farther. I believe we should operate on a well-grounded suspicion, as not a few cases are obscure, and if we wait for a conclusive diagnosis, we shall do so at the peril of the patient. Only day before yesterday I had a case in which I was removing a uterus *per vaginam* for pelvic trouble. Following the uterus into the opening at the vaginal vault was the sac of an extrauterine pregnancy which had not been suspected and could not have been recognized in the midst of indurated tissues. In conclusion I would repeat, operate on every case of ectopic gestation and operate early.

Dr. D. S. Hanson, Cleveland: As a general practician, I wish to say a word in regard to making a diagnosis before rupture. The general practician is more apt to see the case than the surgeon. The diagnosis can often be made out. The cases I have seen have been women who have lived in wedlock for years without bearing children. They have almost invariably complained of abdominal pain upon the side upon which ectopic pregnancy is located. They have complained of peculiar symptoms, but especially of pain in the abdomen. In cases of that nature, I think it advisable to give an anesthetic and make a diagnosis before dangerous symptoms arise. I have only met six cases. I had an opportunity of examining four of these cases before rupture. In one fleshy woman I missed the diagnosis. I always regretted it. In the other cases I made the diagnosis. Out of the six cases I had one of ovarian pregnancy that went on to term.

Dr. Y. Wardlow, Columbus: I am glad to have heard Dr. Johnson's splendid paper and have been greatly instructed by it. I have one or two remarks to make, however. In the first place I am rather surprised at the attitude the doctor has taken in support of Tait's statement, that these cases are so seldom seen before rupture. In the treatment of chronic gynecologic troubles you will often strike cases that are, or ought to be, recognized before rupture. I am surprised that Dr. Johnson has not made mention of another route. Where there seems to be no active hemorrhage, or the tube has not ruptured, the vaginal route offers

advantages, especially if the operator is prepared to go in from above in case it is necessary.

In my last three cases I have done two through the vaginal route and in the other, after having gone in from above, the operation was performed practically as though it had been done through the vagina.

Dr. T. M. Wright, Troy: My experience is limited to two cases and the symptoms were the general symptoms, but the physician was not called for forty-eight hours.

Now as to the route: It does not seem to me a proper or feasible procedure to attempt to reach rupture from the vagina when you cannot see where it is or how much hemorrhage there is. You ought to be able to see it, to tie it off, and to give the woman the best chance.

Dr. Edwin Ricketts, Cincinnati: Two cases come into my mind that illustrate the early and the late methods. Both recovered. Some fifteen years ago I saw in consultation with the late Dr. Gibson of Portmouth, a lady who had been in a state of sepsis for two years. There was a lump in her side. We knew comparatively nothing of extrauterine pregnancy at that time. At one of her stools a suspicious looking bone was passed. It was handed to the Doctor and found to be the rib of a fetus. Rectovaginal fistula was present. We gave ether, dilated the rectum and delivered the remains. The rectrovaginal fistula healed. She got well and was delivered of one or two children afterwards. But look at the length of time it took her to work out her own salvation. Look at the risk from sepsis. Would that be the procedure of today? Would we subject our patients to such risks for three or four years? The other case was three years ago. The patient had been complaining for a short time only. The Doctor made a diagnosis of extrauterine pregnancy and I was called in consultation. Concurring with the Doctor, the abdomen was opened and a three-months' fetus found in the peritoneal cavity. The placenta was walled off and had almost reached the point of breaking down. The operation was very easy and in twenty-one days she was up and about the house. One twenty-one days and the other four years, and yet men advocate non-interference! Trust to luck and nature! Which is surgery? How are you going to know the difference?

There is only one set of men who are certain of the diagnosis, the men who advocate electrolysis. Those of us who open the abdomen, see wonders after it is opened. I never saw Tait refuse to operate. Those operators who advocate early surgical interference in extrauterine pregnancy and in appendicitis as well are the men who have the fewest deaths. When those who advocate procrastination bring out their statistics, they always fall short.

Dr. J. B. May, New Holland: As a general practician I am very much interested. A short time ago I was on the anxious seat for two months until later developments showed a normal pregnancy. We frequently pass over some of these conditions unawares. The thing most useful is to differentiate. In this case, almost every diagnostic symptom was negative until motion was developed.

(Question). How many hematomas have you had?

Dr. May. I wish I could tell you. I may have had them and not recognized them. We need more light on the diagnostic symptoms. I have been in the habit of doing all kinds of work in emergencies, as a general practician. I would like some of the specialists, or the essayist, to give us some light on diagnostic points previous to rupture.

Dr. F. F. Lawrence, Columbus: I regret I did not hear the early part of this paper. There are some points suggested by one or two recent cases in my own work, together with observation of several others, one of which was recalled to my memory during the discussion. About eight years ago, a woman thirty-seven years old, was supposed to have extrauterine pregnancy. Operation was advised and refused. We waited. Necropsy revealed extrauterine pregnancy and, primarily, extraperitoneal rupture. Also from the free end of the tube a large amount of hemorrhage flowed into the peritoneal cavity and a septic condition resulted. It is one of the first cases I have known in which hemorrhage might occur from the free end of the tube into the peritoneal cavity and the rupture be extraperitoneal. It seems the question of diagnosis affords enough uncertainty as to whether the hemorrhage is confined to the folds of the broad ligament or not. A lady forty-three

years old in excellent health until eight weeks ago, was suddenly seized with pain in the right hypochondrium, followed by flowing at intervals for a few hours. She passed shreds, clots, etc. On examination there was found a big pulsating mass, to the right of the uterus, fixed with extreme firmness and apparently filling the fold of the right broad ligament. It was sensitive. Secretion could be forced from both breasts. The cervix was not elongated and the body soft. Diagnosis of extrauterine pregnancy seemed clear. Operation showed the mass one of two things, either sarcoma extending into the tube, or tuberculosis. There were no tubercular deposits any place else and no pus. Another case a few weeks prior to this, a women aged thirty-three years, married twelve years, never pregnant. She began suffering from pain, confined to the left side; there was no bleeding, no shock, no indication of rupture. Examination revealed a mass to the left which had a doughy feeling, like a pus-tube. Operation showed a ruptured extraperitoneal pregnancy with the cavity filled with blood.

We know hematocele suppurates. Can we by any means say to our patients or to the physician, this case will not suppurate? Neither are we certain when we have primary rupture that a secondary rupture will not prove fatal before relief can be afforded. It seems the future is one that must be carefully studied. I do not see that the danger of operation, if carefully and quickly done, can be commensurate with the risk of not operating. There will be much greater danger in leaving the case alone than in operating. If the operation is done promptly, there is no danger.

Dr. J. B. Ray, Omega: I did not intend to take part but I feel I must report a case. During my practice I have made the diagnosis of ectopic pregnancy four times. I will only report one. I saw the case probably about the fifth month. I speak of it on account of the apparent rarity of the extraperitoneal form. I followed this case through until term, opposing operation. The woman became as large as at any ordinary gestation, the child moving plainly. At term the movement became more feeble and finally stopped. The woman was not in bed a day. The operation proposed was refused. She went on perhaps nine months, apparently as large as ever, but the tumor gradually decreased and finally resumed natural size.

Dr. Johnson, closing: I will only take a moment or two in regard to the cases where we have extraperitoneal rupture. When we have a hematoma no one ever thinks of making a section to clean out that hematoma. It is absorbed. Cases of hematoma should be left alone so long as we have no ugly symptoms, rapid pulse, etc. I advocate operating upon these peritoneal cases where suppuration takes place.

The vaginal route is good in some cases, better than through the abdominal wall, but you always run a chance of finding something wrong in the abdominal cavity. There may be hemorrhage taking place. I saw a case this last summer, operated upon at the eighth month of gestation. I opened the abdominal wall and found it only a small matter to puncture the vaginal wall. It was simply out of the question to operate in that way.

The diagnosis of these cases of extrauterine gestation is difficult; no one can be certain prior to rupture.

REPORT OF A CASE OF OVARIOTOMY DURING PREGNANCY

BY JOHN E. SYLVESTER, M. D., WELLSTON

When I was asked to contribute to the program of this meeting I hesitated through diffidence, feeling that so many others of wider experience and better library facilities could more profitably occupy your time. But reflecting that many interesting and rare cases are seen by obscure country doctors and lost to science for lack of record, I concluded to give you a page of such experience, hoping that, if in itself not showing anything new or instructive, it might serve as a text to draw out from our metropolitan brethren present some authoritative remarks on the subject of the paper.

I was called in April, 1896, to see Mrs. W., living near Wilkesville, Vinton county, Ohio, to meet Drs. E. M. Dixon of Wilkesville and George K. Ewing of Ewington, who were in attendance on the case. I learned the following history: Mrs. W. was 28 years of age, of small frame and weighed

when in health 127 lbs. She had been married 16 months. About April, 1895, she noticed that her abdomen was enlarging, and although she was regular monthly she supposed she was pregnant. In August she had a sick spell that she supposed was a miscarriage caused by heavy lifting. Her size did not diminish but she does not seem to have had much misgiving as to her condition. She menstruated regularly until December but then missed and supposed herself again some months pregnant. In April she thought labor was about to come on and she sent for Dr. Dixon, and at his suggestion Dr. Ewing saw her some hours later. They recognized the fact that the abdomen was full of fluid, probably encysted, and I was sent for. The next day, April 6, I saw her and found her largely distended and quite uneasy from the pressure. I could easily satisfy myself that she had a large ovarian tumor, but could not fully decide as to the existence of pregnancy. I advised ovariotomy, but not having been informed of the character of the case I was unprepared for immediate operation. Having another laparotomy on hand that required close attention, I did not get to see Mrs. W. until April 14, when I found her anxious for the operation which was done with the assistance of Drs. Dixon, Ewing and H. M. Hamilton, of Vinton.

When she was laid on her back to begin the administration of the chloroform, which is the anesthetic I generally employ, the pressure of the great tumor caused a regurgitation of bilious fluid from the stomach and so distressed her that I turned her on her right side until after the cyst had been opened. The cyst-wall was quite strong and was adherent to the anterior abdominal wall over a space the size of the hand but was easily detached. On tapping, two wooden-bucketfuls of brownish fluid were drawn off from the main cyst. A number of walnut-sized cysts were found at the base of the tumor. The pedicle was attached to the left side of the uterus which was seen to be at about the fifth month of pregnancy. The tumor was tied off with the Staf-

fordshire knot. The right ovary was healthy. On the front of the uterus was a small accidental scratch through the peritoneal covering that bled freely and was only partially checked by pressure. I feared the effect of much manipulation of the gravid uterus and after drying the pelvis the peritoneum was closed with continuous catgut and the muscles and skin approximated with silkworm-gut sutures. The patient was put to bed in good condition. The tumor and contents weighed 40 pounds. The next evening I visited her and found her pulse 120 but no marked elevation of temperature, no thirst or other evidence of hemorrhage, no distention of the abdomen or signs of peritonitis. I stayed all night and watched her closely. She had an anxious septicemic appearance, but was calm and self-possessed. Despite vigorous stimulation the pulse steadily increased in frequency until when I left in the morning it was 132 to 134 per minute. Dr. Ewing came in the morning and drove me to the train, getting back shortly before noon. The next day when I was expecting a letter notifying me of her death I received this remarkable and cheering account from Dr. Ewing: "Dear Doctor, I stayed with Mrs. W. yesterday afternoon and all night. At noon the pulse was 148 to 150, temperature 103°. I removed the feather-bed and all the bedclothes and the clothing of the patient, removed the bandage, washed her, bathed her in spirits camphor, gave her an injection and moved her bowels, opened all the doors and windows, gave her strychnin freely in enormous doses, also the same with digitalis and gave her whiskey enough to make ten men drunk, gave malted milk freely. This morning the temperature is normal (98½°), pulse 106, tongue moist, no chill." The next day he writes: "Temperature 99°, pulse 96 to 98;" and two days later, "The wound is healing nicely, pulse 96, temperature 99°". On the tenth day I saw her and removed the stitches and found that the wound had healed by first intention without even any stitch abscesses. During this time Drs. Dixon and Ewing had

visited her alternately. One peculiarity of the case was called to my attention. The afternoon of her worst day she developed a very pronounced corpse-like odor, and when I saw her on the tenth day this odor was plainly perceptible although she was bright and cheerful and without any serious symptoms. Shortly afterward Dr. Dixon removed from the neighborhood and when her eight-and-a-half-pound boy was born September 2 she was attended by Dr. Ewing. He reported that there was nothing remarkable about the case, except that with every pain the uterus was drawn strongly to the sound side, thus complicating the labor. In order to get the head to engage in the superior strait he had to hold the uterus forcibly away from the right hip. In a recent letter the patient says, "Just before I was married I was standing on a stand and it tipped over and I fell with my whole weight on the left side, and after that the left leg would give out and feel very badly. I am perfectly well now. I have two babies now. The boy is 19 months old and the girl is 2 months old."

I have ventured to bring this case to the notice of the Society in order that certain points relating to this class of cases may be touched upon and that the latest teachings may be made plain in the discussion that may follow. These cases are by no means rare, for some hundreds are now on record, and yet I have failed to find that any acknowledged rule of treatment is followed. It is interesting to trace the development of any operation or plan of treatment and note the varying phases of opinion year after year until out of the chaos there crystallize definite rules for our guidance. For 25 years or more cases of ovariotomy during pregnancy have been reported; at first unintentional ones, then intentional ones done under peculiar circumstances, until the number of cases is now large, but still the complication and its management is an unsettled topic, so far as my reading goes. Though treated of in the reports of cases in the journals, writers of systematic works either

ignore the complication or dispose of it in an unsatisfactory manner. I notice that Skene does not mention it. In the article by Coe in Keating and Coe's Clinical Gynæcology Treating of Neoplasms of the Ovaries, Tubes and Broad Ligaments, the occurrence of pregnancy in connection with ovarian cystoma is treated of at some length, and we are told that the "treatment of the complication will be discussed in another section." I can testify from experience that nothing is more exasperating than the fruitless search for that section. It is possible that the author means to dispose of this question when he says "The long list of contraindications formerly mentioned in textbooks has now been shortened so as really to include only disease of the thoracic and abdominal viscera so advanced as to interfere with the performance of any other major operation." The treatment of all these cases was at first expectant, then the choice lay between tapping and the induction of premature labor. As tapping has been abandoned in the treatment of ovarian cysts generally, so has professional opinion set against it in these cases, until Hohl, as abstracted in the *American Journal of Obstetrics* for February, 1897, says of cysts complicated with pregnancy, "Puncture of the cyst as a therapeutic measure is out of the question." Dunlap, up to 1880 at least, had followed the practice of producing abortion and then doing ovariotomy. Various writers from time to time advocated ovariotomy, but in 1890 it had not been fully accepted, for Lusk in his work on Midwifery of that date says that "Owing to the rapid increase in size of the tumor which commonly results from pregnancy and in consideration of the relatively favorable issue of ovariotomy performed upon pregnant women, the radical operation during pregnancy promises to prove in future the most advantageous form of treatment." Since that time however, operators have opened the abdomen with increasing confidence. Sutton of Pittsburg has even used hot irrigation of the abdominal cavity for the relief of hemorrhage after

ovariotomy without disturbing pregnancy. It is not to be taught that all cases should be subjected to operation. Of course a large uncomplicated cyst, such as our patient had, calls for a radical operation. Even tumors of moderate size, if allowed to remain, are a source of great danger from the liability to twisting of the pedicle at any time, as well as to accidents during labor. In the Cavendish lecture for 1897, Sir John Williams says that the effect of such tumors on labor even when no great difficulty in delivery occurs is appalling, and that removal of the tumor or Cæsarean section anticipating labor is the only safe plan, unless the tumor is small and can be pushed up out of the pelvis. The mortality of ovariotomy in pregnancy is only half that of cases left to natural labor, hence a small tumor discovered early in pregnancy should be removed if it shows a tendency to rapid enlargement. Intraligamentous cysts and those with very short pedicle or such adhesions as would make an operation very difficult and render a miscarriage very probable would call for the emptying of the uterus first, for abortion after ovariotomy is exceedingly deadly. Small freely movable tumors that show no tendency to enlarge under the stimulus of pregnancy may be allowed to remain, though at some risk, for any patient with a tumor either internal or external and however benign has in her an element of danger. Generally speaking, the time to remove any growth is as soon as it is discovered.

The failure to recognize definitely the coexistence of pregnancy is embarrassing to the surgeon and is liable to be very damaging to his reputation, and yet I am satisfied that it is often difficult for the expert specialist, and much more so for the occasional operator. Coe writes that he has "long since arrived at the conclusion that in the absence of the characteristic symptoms the diagnosis of normal pregnancy at any stage may be one of the most difficult in the whole range of medicine;" and so able a gynecologist as Pippingskoeld acknowledges that he was unable to cer-

tainly diagnose pregnancy at 8½ months when complicated by a large ovarian cyst. Twenty years ago Thomas taught that in certain cases the sound should be used, holding that it were better to produce abortion rather than to risk opening the abdomen when in doubt. With our present knowledge I believe I am warranted in saying that the rule would be when in doubt as to the coexistence of pregnancy operate, if the tumor and the condition of the patient otherwise will warrant it.

DISCUSSION

Dr. D. Tod Gilliam, Columbus: The doctor says in the latter part of his paper that the treatment of these cases has not been crystallized. I think the profession is pretty well in accord as touching the treatment of ovarian cystoma in connection with pregnancy. The effect of the growth on pregnancy and parturition is evil from the first. In the first place it leads to abortion in about 20 percent of the cases. The dangers arising from the association are manifold. These arise from overdistension, from pressure, from reflexes, from suppuration, and from gangrene of the cyst. When it comes to the time of parturition the danger is vastly increased, the mortality mounting to 50 percent or thereabout. The death-rate where operation has taken place ranges from one to five percent, seldom reaching the latter mark. The chances are therefore all with the operation. The question to determine is when to operate. The earlier we recognize the cyst and operate, the better the chances of the patient. Between the third and fourth months the results are almost uniformly favorable. After this, every week increases the danger. Operation at the time of labor is attended with great danger on account of the uterine contractions and contractions of the muscles of the abdomen. Still, even here the chances are better with than without operation. The better plan in these latter cases is to perform Cæsarian section and relieve the patient of the dangers incident to the expulsive efforts. The cysts giving the most trouble are of the smaller size because they gravitate into the pelvis. Such cases can sometimes be managed by pushing the cyst above the pelvic brim and out of harm's way. At others the cyst may be tapped through the vagina. Such makeshifts, however, are attended with more danger than the radical operation of ovariotomy and must of necessity

be followed by operation. The dangers incident to a vaginal puncture need not be dwelt upon, but where the fetus is dragged over the cyst and the latter is compressed between the unyielding structures of the fetus and pelvic walls there is great danger of gangrene or suppuration and especially in cases of dermoid cyst. The practice of bringing on premature delivery is only mentioned to be condemned. The danger of operation is very small. The patient seems to have greater recuperative power than in the unimpregnated state and barring the possibility of miscarriage has at least an equal chance. As a rule the operation is easy, because uncomplicated. It is uncomplicated because a woman seldom conceives who is the victim of a large or adherent ovarian cyst.

Dr. J. F. Baldwin, Columbus: I heartily agree with what Dr. Gilliam has said. I have had a little experience, having had four cases in which pregnancy and ovarian cyst existed together. The first, more than two months' pregnant, had two ovarian tumors. I operated in the usual way, at her home, being especially careful not to touch the uterus. There were few adhesions. The patient made a prompt recovery and was delivered without difficulty. The next case occurred in the city. The physician did not know she had a tumor. She developed a sharp attack of peritonitis. Two or three weeks later, when the peritonitis seemed to be subsiding, she was operated on. There were extensive adhesions but they were easily swept away. The tumor, weighing fifteen to twenty pounds, was easily removed. The third case was obscure. There was some doubt as to pregnancy. She was examined by several other physicians who were sure she was not pregnant. I examined her and thought I could feel fetal movements and could hear very faintly, heart sounds. I advised waiting. Abdomen and pelvis were full of the mass. X-Rays were used, but unfortunately the plate was a failure. She fell into other hands. It was found she was pregnant. She was delivered at full term of a still-born fetus. She was very anxious to have a child and I was hoping I could tide her along. Inflammation and suppuration set in in the tumor and it discharged through the vagina. The fourth case consulted me a year ago last March. Married six years; never pregnant. Periods scant for the past six months. Had a cyst extending nearly to the umbilicus, distinctly ovarian. I

advised operation to guard against possible contingencies. The patient went home to consider the matter. It seems about nine months from the time she was at my office she had a full-term child. The tumor still existed somewhat larger. She was delivered without a particle of trouble. She is still clinging to her tumor in spite of advice to the contrary.

I was not aware the mortality was as high as fifty percent when these cases go on to term. I question if the mortality would be so high if we could get all these cases together. If a case proves fatal as the result of delay or neglect, it is more apt to find its way into the statistics. Of course we would find the mortality very large, much larger than if operation were made.

Dr. R. B. Hall, Cincinnati: I have a patient who became pregnant after she knew she had an ovarian tumor. She was in bed two months during her pregnancy, following a sharp attack of inflammation. For several weeks her life was despaired of. The family physician urged operation but it was not consented to. She is now the possessor of a fine baby as well as her tumor.

I have had the good or bad fortune to see quite a number of these cases. I am convinced there is not much more danger from ovariotomy before the end of the fourth month of gestation, than from any other ovariotomy, unless there are adhesions or you have to manipulate the uterus. When you have to manipulate the uterus, there is danger of abortion, and that adds to the mortality. I had a case of a thin-walled cyst, universally, but not firmly adherent, with another ovarian tumor on the opposite side. I made a double ovariotomy, did considerable injury in the pelvis and was compelled to handle the uterus. The patient did not abort, but was delivered six months afterwards of a healthy child, now living. The patient developed acute mania and for two or three days we had to restrain her forcibly. I urged the operation because the patient had an adherent tumor below the uterus. The tumor was small, but it was evident she could not be delivered without tapping the tumor. Another case was operated on at five and a half or six months, and the tumor and contents weighed thirty-six pounds. The patient had no trouble at confinement and has a living child.

CHAPTER VIII

OPHTHALMOLOGY

PARTIAL CATARACT

BY C. F. CLARK, M. D., COLUMBUS

In the following pages it is my object to discuss briefly some of the more important phenomena of partial cataract and especially the principal phases of the subject that have a bearing upon the proper interpretation of certain symptoms which present themselves to the general practician as well as to the ophthalmic surgeon in the examination of the eyes.

In the study of cataract as in other departments of medicine, what appears to be a very limited subject is found upon closer observation to contain many points of interest which at first escape our attention.

To a large proportion of the profession the word cataract conveys the idea of an opacity of the crystalline lens or its capsule which gradually increases, causes blindness, and necessitates an operation for the extraction of the lens. It is true that the above presents the most striking features of the subject of cataract when considered from a general point of view, and while to those who confine their work to the field of ophthalmology every detail of the etiology, pathology, and all that concerns that triumph of surgery, the successful extraction of cataract, is of absorbing interest, it is not strange that in the enormous range of subjects of vital importance among which the general physician must divide his attention there seems to be so little time

left for one so technical as this. When we realize, however, that even among young people some degree of opacity of the lens is often present, though undetected, and as age advances certain changes invariably take place in its character, and that in a large proportion of those who are never led to suspect it, a careful inspection will reveal the presence of incipient cataract, we see at once that its development is far too important a phenomenon to be ignored by one who desires to have the power of accurately interpreting all the symptoms his patient may present.

It is often only in its advanced stages that those who have cataract present themselves to the ophthalmic surgeon for examination and it is safe to say that only a very small proportion of those who have opacity of the lens properly interpret their symptoms or subject themselves to a systematic examination. For their peace of mind perhaps this is well, as in many instances there is no reason why they should be disturbed about incipient cataract while it is in such a stage as to be susceptible of no relief, but as a misinterpretation of their symptoms often leads to unavailing efforts to obtain relief by various means which in many instances are hurtful, the power to discover the true cause will often enable their medical adviser to be of great service to them. If this discovery is made as it often may be, without the formality of a minute examination, its value both to the physician and his patient is greatly increased, as, while nothing will take the place of an accurate, scientific and thorough-going physical examination, this in some instances is entirely impracticable at least for the time being, and it is often therefore extremely desirable that the physician's powers of perception should be so cultivated that he may draw reasonably accurate conclusions from the limited evidence before him.

It might naturally be asked, if cataract is so simple an affair and in a portion of the eye so easily seen, why should

one not depend entirely upon an inspection? Where through the pupil, which is generally small in old people, distinct opacities may be readily seen, a positive diagnosis is of course made, but in the absence of such evidence it is by no means safe to arrive at the conclusion that cataract does not exist. Conclusions drawn from an examination under such circumstances, unless it is most carefully and searchingly conducted, may be a source of serious error. I would not for a moment seem to minimize the importance of the most thorough and minute physical examination which should avail itself of every instrument of precision that will throw additional light upon the problems with which we have to deal. We rely upon these means implicitly, but I sometimes think that in doing so we are in danger of becoming a trifle too mechanical in our methods and losing sight of that method of acute, thoughtful, personal observation and the exercise of those powers of deduction which enabled the older school of physicians with the cultivated instincts of the older school of naturalists to draw, in many instances, as truly accurate and practically useful conclusions from their crude and primitive means of research as we now draw from the far more elaborate means at our command. While gaining all we may by the great discoveries and inventions of our times we will lose nothing by cultivating the powers of observation which enabled our predecessors to do so well without them. A thorough knowledge of the anatomy and physiology of the eye, such as is possessed by every well-educated physician, will make it possible, when thoughtfully applied, to draw most useful and in many instances accurate conclusions from certain symptoms described by their patients even where a thorough examination is impracticable; and it is the object of this paper to direct attention to a few of these symptoms.

The average age of the members of this society is such that it is probable that an investigation would reveal the

fact that a large number of those among us who make complaint of nothing more than slight dimness of vision would find upon careful scrutiny that either the radiating striæ or the outer layers in the periphery of the crystalline lens were undergoing changes which would justify the diagnosis of partial or incipient cataract. It does not follow from the above statement that all of those in whom such changes are found should look forward to the development of mature cataract, or that of necessity anything should be done for them, but it is a fact that in a certain proportion of these cases asthenopic symptoms do present themselves which require attention. These symptoms are more frequently observed when changes in the lens make their appearance before the period in which the accommodative power has been gradually reduced by the advance of presbyopia. In brief, it might be stated that if the rigidity of the lens, which often accompanies opacity, makes its appearance before the natural development of presbyopia has caused a cessation of the activity of the ciliary muscle, the action of that muscle in its effort to relax the suspensory ligament, and thus bring about accommodation, being unavailing, leads to congestion, and in many instances, to pain and discomfort.

When we consider that in a large proportion of cases the development of opacity of the crystalline lens is not an isolated process but is due to degenerative changes in the choroid coat or the whole uveal tract, it will be unnecessary to apologize for a presentation of the subject which shall have as its aim to make more clear the phases of cataract which manifest themselves before it has reached maturity, before it has developed to that interesting stage when we may restore vision by that brilliant operation which has been perfected until it takes, perhaps, the leading position among conservative surgical procedures, namely, the simple extraction of the crystalline lens. The fascination of all that concerns this operation is such that it is with some difficulty

that an opththalmic surgeon persuades himself to leave it to discuss other aspects of the subject of cataract.

When we recall the embryonic development and the somewhat complicated histology of the crystalline lens, its mode of growth, the source from which it derives its nutrition and the delicate adjustment of waste and repair which must be preserved in order that such a structure shall maintain its elasticity and transparency and continue to perform its important function, and when we realize that any molecular or cell change in its tissues which disturbs the existing uniformity of the index of refraction of its constituent parts is accompanied by the opacity which we term cataract, it is not strange that a great variety of forms of cataract should be found, and with these varying forms there arise a variety of symptoms which are well worthy of our attention.

The sclerosis of the lens which begins in childhood and advances gradually throughout life is properly recognized as a physiologic process. With increasing age it causes a dull reflex to appear in the pupil when light is thrown in obliquely and this varies greatly in different individuals, but it is not difficult to distinguish from true cataract. When, however, true cataract develops, there is usually even in the early stages a marked difference in the degree of transparency of the various portions of the lens. The nucleus which in the normal eye is more dense than the cortical layers, may become proportionally still more dense, thus accentuating the distinction between nucleus and cortex. The opacities of the outer layers of the lens may assume a great variety of forms in accordance with the portion of the cortex affected and these varying conditions will be accompanied by corresponding variations in the symptoms.

In the early stages of cataract we naturally expect to find dimness of vision, but surprising as it may seem, it is not infrequently the case that excellent vision coexists with well-defined incipient cataract. I could cite many instances

from my case records in which, with vision of 5/5 or 5/6, a minute inspection by oblique illumination has revealed pronounced opacities in the peripheral portion of the lens.

Dimness of vision, therefore, while usually present, may be absent, and as it may result from so many other causes its value as a symptom is comparatively slight in the early stages of the development of lenticular opacity. As long as the central portion of the lens remains clear the vision may be excellent. In this connection it is to be remembered, however, that statements as to their acuity of vision when made by patients who are of the age to develop senile cataract are to be taken with much allowance, as the diminution of vision usually approaches so insidiously that, unconsciously, the patient often adjusts his standard of accurate vision to that of which his own eyes are capable.

In the early stages of cataract complaint may be made of motes either fixed or floating before the eyes. If fixed, these are sometimes due directly to the lenticular opacity, but cataract often develops without the patient ever referring to the presence of fixed motes before the eye. A valuable and quickly applied subjective test for the presence of such motes is one recently suggested by a French writer, namely, to hold before the eye a strong concave lens of about one-inch focus while fixing the attention upon a distant light in a darkened room. By this means a spectrum of the lens is seen which reveals such opacities as may fall within the pupillary space.

Floating motes before the eyes will suggest degenerative changes in the vitreous due indirectly to disease of some portion of the uveal tract, and if large or numerous are very significant, often indicating that the cataract is secondary to the process which has produced the vitreous opacities. Fairly good vision when the eyes are shaded, becoming very imperfect when a bright light shines into them, usually indicates the presence of a greater degree of opacity in that portion of the lens occupying

the center of the pupillary space than is found in those portions which are exposed when it is moderately dilated. This condition is frequently observed and often leads the patient to shade his eyes with the hat rim or to wear smoked glasses in an instinctive effort to assist his vision without knowing why he does so.

A change in the refraction of the crystalline lens making its appearance before the opacity has reached such a stage as to actually make good vision impossible is frequently encountered in our study of the progress of cataract and gives rise to some very interesting phenomena.

It is said that the lens continues to grow from birth to the eighteenth year and it is well known that this growth is largely in the direction of the equator. In making a section of an adult lens, even where there is no evidence of the development of cataract, one is struck by the marked increase in the density of the nucleus as compared with the cortical layers. The outer layers, therefore, either because they are younger, or more probably, as is believed by many, because they are in a better position to imbibe the nutritive fluids of the eye, are much softer and more elastic than those in the deeper portions or nucleus.

While there is no sharply drawn line of demarkation between the cortical and nuclear layers, it is in the former that we most frequently note the evidence of those degenerative changes which we term cataract, and in the earlier stages of this process, before sufficient change has taken place to cause easily recognized opacities, it sometimes happens that with increase in the absorption of the surrounding fluids there is brought about an increase in the curve of the anterior capsule such as will make an eye, formerly hyperopic, distinctly myopic.

This is not an infrequent occurrence and accounts for many of those cases of "second sight" or abandonment of presbyopic glasses after using them for years of which we

hear so much from our patients. Second sight is generally a short-lived joy; it is almost certainly followed sooner or later by distinct evidences of cataract.

The radiating suture lines or striæ of the lens separate its substance into sectors which, as the cataractous process continues often vary somewhat in their density or refracting-power and the point at which they focus, forming separate images on different portions of the retina, and thus we have developed that curious phenomenon known as monocular diplopia or polyopia. Of this little need be said, as it is a mere clinical curiosity.

A symptom of far greater practical importance, however, and one of comparatively frequent occurrence in the very early stages of senile cataract when it develops in relatively young subjects, and judging from my own cases, of still more frequent occurrence in what is known as punctate, congenital cataract, is a somewhat intractable form of asthenopia apparently resulting from the effort which the eye makes to accommodate or adjust itself to varying distances in spite of the comparative rigidity of the lens, while the muscle of accommodation still has sufficient power to act and has not yet realized the futility of the struggle.

In the routine of examinations made for the purpose of discovering and correcting errors of refraction it sometimes happens that, while distance vision may by the use of appropriate lenses be brought up to the normal standard and a fair degree of accommodative power may exist, any effort to use these glasses especially for continuous work near at hand is accompanied by symptoms of asthenopia similar to those produced by excessive accommodative effort when a degree of hypermetropia or astigmatism is left uncorrected. This condition is not infrequently observed in patients between forty and fifty-five years of age who still have some accommodative power but whose crystalline lenses are less elastic than is normal owing to the beginning of the degenerative process which we term cataract. It

manifests itself to a much higher degree and for longer periods in the case of congenital, punctate cataract above referred to and in cases where we find numerous small, often stationary, opacities distributed through the lens in comparatively young people. It is to this class of patients especially that I wish to call your attention.

In these cases the real cause of the peculiar irritability of the eyes on attempting to read, which persists in spite of glasses correcting the refraction error, is only discovered when, with the pupils well dilated, a thorough inspection of the lens is made by the aid of oblique illumination.

In looking over the records of the last 250 cases of cataract of all forms seen by my associate, Dr. Rogers, and myself, during the last three years, and excluding juvenile, lamellar and traumatic cataract, I was struck by the fact that forty-six were found among patients still young enough to have active ciliary muscles. Thirty-seven of these had practically normal vision, ranging from 5/6 to 5/5 when their refraction errors were corrected, and almost all came complaining of asthenopia rather than of dimness of vision.

A minute examination by means of oblique illumination revealed small clouded areas in the peripheral layers, sometimes few in number and sometimes numerous, or minute points of opacity scattered throughout the lens-substance in such a manner as to make it seem incredible that in spite of this obstruction the patient had vision of 5/5, or average normal acuity.

The most minute and accurate correction of the refraction error and the utmost pains in the adjustment of appropriate glasses in these cases, while affording great relief and gratefully accepted by the patient were not sufficient to give complete rest to the ciliary muscles, handicapped and interfered with as they are in the performance of their function. Many cases of partial cataract, especially those appearing in young subjects, are stationary and yet do not interfere with useful vision to such a degree as to warrant op-

erative interference. Many on the other hand, both among the young and the old, advance to such a point as to make the pursuit of a useful occupation impossible and then progress so slowly as to place the unfortunate subjects in a pitiable condition.

It was formerly the custom among many ophthalmic surgeons to do a preliminary iridectomy when it seemed possible to temporarily improve the vision or to advise those having such a form of cataract to await, with what patience they might be able to summon to their assistance, the time when the lens would become sufficiently disintegrated to allow of its easy and complete removal.

There may still be cases in which such advice is good, but improvements in the technic of cataract extraction and especially the rigid application of modern aseptic methods which had some of their earliest and most wonderful triumphs in the field of ophthalmic surgery, have robbed the operation for the removal of immature or partial cataract of half its danger.

In the removal of an immature cataract a certain amount of lens substance consisting largely of more or less of transparent cortical cells necessarily remains behind in spite of careful manipulation and thorough irrigation of the anterior chamber. This, while undergoing absorption by the action of the aqueous humor, produces some mechanical irritation and if added to such irritation there is a degree of infection we have a most unpromising state of affairs.

The eye in a case of uncomplicated cataract easily tolerates the mechanical irritation produced by a reasonable amount of this loose cortical substance but adding to this the element of infection changes entirely the problem with which we have to deal and it was the failure to appreciate the significance of this element that led the older ophthalmic surgeons to attribute the bad results which they obtained in such cases entirely to the presence of this source of irritation and hence to hesitate to operate on immature cataract.

When a patient is so situated that he can afford to await the maturity of a cataract it undoubtedly adds to our assurance of success and every chance in the patient's favor should be taken advantage of when dealing with so serious a matter as the restoration of vision, but in a number of cases on which I have operated during the last few years in which the circumstances have made it necessary to remove immature cataracts the results have been so admirable as to convince me that we have often unnecessarily delayed operation on account of incomplete opacity of the lens.

In conclusion it may be asserted with confidence that since we have learned to adhere strictly to the principles of asepsis in the practice of ophthalmic surgery the danger of an operation upon an immature or partial cataract has been materially reduced, and if the patient is so situated that years of waiting mean years of privation and that pitiful relaxation of his hold upon the world and the reduced physical condition resulting from the mental depression that so frequently accompanies blindness, we should undoubtedly operate even if the cataract is not mature.

DISCUSSION

Dr. Robert Sattler, Cincinnati: This paper was of very great practical interest especially to a specialist. I believe these cases are always interesting from a diagnostic as well as etiologic point. I believe many of the cases are dependent upon a gouty or rheumatic diathesis. We all know there are cases in which cataract exists, and often the greatest fear is instilled by apprising a person of that fact. If nothing were said, that person might go on comfortably and the fact never be realized.

Dr. Clark, in conclusion: I believe I have nothing to say. There were a few points I wanted to bring out in the paper but I was not aware of the rule as to limitation of time. I beg the Society's pardon. The one point, the only important practical point, is that which concerns the treatment for the relief of these symptoms. There are many cases where the refractive error being corrected, and the vision

good, asthenopic symptoms are still present. These cases do not lend themselves to operation: we are not justified in operating. They are a source of extreme annoyance to the oculist because of the persistency of the symptoms.

Since we have the aseptic method however, we may now venture to operate upon cataracts where it was formerly impracticable. The older operators could not successfully operate early and they thought the trouble they encountered due to retained cortical substance while in reality it was due to this cause plus infection. The amount of mechanical irritation is important, but if we leave cortical substance in the eye after the extraction of cataract, the disturbance is not great provided there is no infection.

SEQUENCES OF ABNORMAL REFRACTION

A Plea for the Study of Eye-Strain

BY D. R. SILVER, M. D., SIDNEY

While specialists have been instant in season and out of season in preaching the doctrine of salvation from many of the ills to which flesh is heir by the correction of abnormal refraction, it still remains true that the profession at large is not thoroughly awakened to the importance of eye-strain in the production of nervous disease.

Strange as it may seem, few men in general practice have cared to inform themselves of the common facts of ophthalmologic science. Books, journal articles, lectures and other sources of information are neglected from the mistaken notion that such knowledge is only necessary to the oculist. As a matter of fact, defects in the organ of vision are responsible for as many obscure nervous affections as are defects of any other organ of the body, and its condition should be a factor in making every important diagnosis. By most men the eye is only taken into account when there is some gross defect or inflammatory change. Whereas,

these plainly-visible flags of distress can be seen only in a very few of the many cases of defective vision.

While it is impossible for the general practician to determine the nature of the difficulty, whether it be one of refraction, muscular insufficiency or other defect, it is important for him to know that the reflex neuroses are quite as likely, yes, far more likely, to proceed from this organ as a focus, than from the teeth, ear, nose or stomach, those organs so commonly suspected and examined as sources of reflex influence.

It is a remarkable and surprising fact that the eye is the only organ of the body the anatomic structure of which must be in perfect order that its function shall be normal. Within certain limits the heart, the hand, the ear, or stomach will each perform its work with precision and perfection, whatever be the mathematic relations of its length, breadth and thickness. The heart or hand, to perform the work of either organ, must, in a general way, conform to what may be called the standard heart or hand; the difference of a fraction of a line in the relation of length and breadth will make no perceptible difference in their working capacity.

The style of the nose may be Roman or Grecian, and the olfactory sense will be equally acute. But the eye must in contour and in structure conform to the immutable laws of optics. Perfect vision depends upon perfection in mechanical structure and the mathematic relations of the various parts of which the organ is composed. Nature has made an effort to provide for her own imperfections in the beautiful system of accommodation. But the over-working of this system, asking it to do work beyond its capacity, is what is meant by eye-strain and all that this term implies. If it were a question merely of perfect or imperfect sight, a matter of seeing with more or less acuteness, it would not be so serious.

But the eye which is not perfect in its optical properties is in danger of destruction. The strain which is made to

attain clear vision produces congestion and consequent change of structure in some part of the organ which may be fatal to its usefulness. Fortunately, the strain often spends its force in producing remediable symptoms, such as headache, vertigo, chorea, sick stomach, nervous prostration, epilepsy, or insanity. Concerning the two last named, I cannot assert of my own knowledge any cases so produced. But I see no reason to doubt the statements of Ranney and others that the exciting cause of both these deplorable conditions can sometimes be traced to eyestrain.

A very important phase of this subject is the question of the effect of refractive errors upon the morals of school children. It goes without saying that vision is a most important factor in acquiring knowledge, and in proportion as vision is perfect will education be easily acquired and knowledge exact. An observation made many years ago convinced me that many a child has been wrongfully condemned, dismissed from school, sent to a reform farm or penal institution, its life blighted and its friends disgraced, for the simple reason that, by inheritance or acquirement it had an error of refraction.

A young man just past the age limit for detention at the home at Lancaster came quite by accident under my care, and, after a correction for hyperopic astigmatism, he said: "If I had had these glasses while at school I could have learned like other boys." He did not know he could not see distinctly. His teachers did not know this to be the cause of his blunders and mistakes in reading. He was called a blockhead and a dullard, and punished without cause until he played truant, was apprehended by the officer, condemned by the judge and sent to the Home for Incorrigibles.

I have known a girl 16 years old to be severely punished at school because she was unable to get the required grade. Her vision in the right eye was limited to counting fingers at three feet. And in the left eye there was a floating

opacity in the vitreous which cut off the line of vision at every movement of the organ. It is too much to say, that every wayward child has imperfect vision, but it is proper to say that abnormal sight may lead to vicious habits and ruined character.

Every child on entering school should have its eyes examined. But as this is impracticable it has been my practice to urge teachers to be slow to punish or condemn any child, who, being bright in other respects, fails to acquire book-knowledge readily. If it be impossible to provide for the examination of children of the public schools, it ought not to be so for those who enter the charitable and other institutions of the state. These reformatories should have examiners capable of making proper tests of those in such institution. If I am rightly informed, no effort is made to ascertain the refractive condition of any child or young person sent to the Girls' Industrial Home at Rathbone, Ohio, or the Boys' Industral School at Lancaster, Ohio. The superintendent of the girls' home, in answer to an inquiry, says:

"Rathbone, Ohio, April 11, 1898.

"D. R. Silver, M. D., Sidney, Ohio.

"Dear Sir:—Your favor of the 8th instant referring to defective eyes at this institution received. Before being committed to this institution, a girl is examined by a physician, who makes a sworn statement in regard to her. A certified copy of the physician's certificate is sent us with the commitment papers. We will not receive an inmate if papers show that her sight is defective. I enclose you herewith a copy of the notice we sent the Probate Judges, referring to commitments. Very truly yours,

"A. W. STILES, Supt."

It is the duty of the Probate Judge to have a health certificate made out by some respectable physician, and the first question on the list to be answered is: "Has the girl perfect vision?" Now, I submit that the average respectable physician is not able to answer this question truthfully.

He misunderstands its import. He honestly asserts what is untrue, and thus the child is handicapped with a false record. It would be interesting to know how many children have been refused admission to the charitable institutions of the state on account of defective vision. The object of the question doubtless is to ascertain the existence of trachoma or some other contagious disease for the protection of other inmates, but this is quite a different matter. I am sure that if proper tests be made of the children in these homes a large number will be found having errors of refraction, which condition is in a greater or less degree responsible for their present position and future prosperity. I desire to call the attention of the committee on legislation to this important subject. The wards of the state are deserving of a better fate than to be condemned by reason of physical defects which are remediable, and which, remaining unknown, will continue to be the bane of their lives.

The Hospital for Epileptics is another institution whose proper working will return a rich reward in settling the question of refractive errors in causing the frightful disease for which this State charity is provided. I am informed by the superintendent that investigations are being made along this line. He says: "We have not made sufficient examinations of refractive difficulties to warrant us in giving out conclusions as to their effects upon epilepsy; but we expect very shortly to pay considerable attention to this branch of clinical investigation."

While this paper was in course of preparation, a bill was introduced in the General Assembly and recommended for passage providing for an instructor for those deaf-mutes who suffer from defective vision. I believe the bill has since become a law and enables the manager to secure the services of a special teacher for those whose eyes have been injured by inflammatory changes, high degrees of ametropia, etc. This action on the part of the law-making power is in the highest degree commendable from the standpoint of the

humanitarian, and marks a high point in this era of enlightened philanthropy.

The loss of the auditory sense is an affection the magnitude of which cannot be estimated by those who hear, and hear without effort. The deaf-mute who has never known the loss of that which he has never had is in a plight sufficiently sad; but when joined to the partial or total abolishment of the sense of sight, the only remaining avenue except touch by which the mind and soul can receive instruction, our sympathies are fully aroused. The stimulus given well-directed effort in the wonderful case of Helen Kellar is bearing fruit in creating sentiment favorable to the giving of increased State aid in the education of the defective classes.

But we have not yet arrived at a point of full appreciation of the importance of this matter. The senses of smell, of touch, of hearing and sight, the special senses by which we can appreciate our environment, if defective, not only lessens enjoyment, but in a greater or less degree hinders mental development. And especially is this true respecting the organ of vision. Objects are to us as we see them. Our conception of form depends upon the perfection of the instrument through which the brain receives its impressions. The effort to take a clear-cut photograph with an imperfect camera will be as successful as the effort to give proper impressions to the brain through a defective eye.

DISCUSSION

Dr. A. R. Baker, Cleveland: There is nothing that will empty a hall so quickly, as the discussion of eye-diseases. I am glad however, to see that several have remained. The doctor's paper opens up an important subject that is of interest to every practician of medicine as well as the ophthalmologist. Undoubtedly a great many children are retarded in their school work, because they do not see well. They are often accused of not being bright. They see a word indistinctly and make a guess at it. It may be right and it may be wrong. If wrong the teacher chides him and ac-

cuses him of being indifferent, careless, and it may be vicious. I have no doubt the doctor's assertion, that children are sent to the reformatory institutions because they have not had errors of refraction corrected, can be successfully maintained. There is nothing that injures a child's disposition so much as constant nagging about faults for which they are not responsible. It is not unusual to find the entire disposition of a child changed, after correction of refractive errors, and the dull, indolent child at the foot of his class becomes one of the brightest in the school.

Dr. N. P. Davidson, Hilliard: This is a subject I am glad to say I have learned to take a very marked interest in. I have learned something of the importance and difficulties of refractive errors. I knew of an instance not long since a case of epilepsy in a boy twelve or thirteen years of age. He went the rounds for several years to all the physicians with no good results from treatment. His parents were influenced to take him to Dr. Prince, one of the leading ophthalmologists in Springfield, Ill., who examined his eyes and gave him the proper glasses. His epilepsy disappeared. That established Dr. Prince in the confidence of the people and gave him quite a reputation.

I see no reason why the general practician should not be able to test the eyes for errors of refraction and be able to prescribe glasses. It is a subject of supreme interest to me and of special interest to the children of the nation. The subject is receiving more and more attention each year as it should.

Dr. Silver, closing: I will only say a word in closing. The children in our reformatories are not properly used. They have not the advantages of proper investigation along the line indicated in my paper. I think many cases are neglected that should be looked after. Not long ago, while this paper was in preparation, the Legislature was asked to pass a law, and did, by which the Superintendents of the blind asylums could employ competent persons to instruct the deaf and dumb who could not see. This is a step in the right direction and is commendable. I see no reason why these unfortunates should not be properly looked after, but the children in the industrial homes should have the advantages given the deaf and dumb.

SURGERY OF THE PNEUMATIC SINUSES OF THE SKULL IN RELATION TO OPHTHALMIC AND AURAL SURGERY

BY ROBERT SATTLER, M. D., CINCINNATI

To review the literature or to offer case reports is not the purpose of this communication, but rather to give a brief synopsis of the results of personal experience with the practical surgery of the pneumatic spaces of the skull, such as fall within the scope of ophthalmic and aural surgery.

Years ago I profited by the personal demonstrations and teachings of Prof. Zuckerkurdl of Vienna. Several years after this, 1882, he published in book-form the results of painstaking labors, under the title "The Normal and Pathological Anatomy of the Nasal Cavity and its Pneumatic Accessories." This anatomic treatise, with its accurate drawings and descriptions, furnished me, as it has so many others, with renewed interest in a subject concerning which there has always been much speculation but little or no certain knowledge, and for this reason no practical surgery.

The pneumatic spaces of the temporal bone, because of their more frequent invasion by acute and chronic pathologic processes, unmistakable symptomatology and imperative necessity for surgical interference, have, long before the other pneumatic sinuses, claimed and received the fullest recognition on the part of the general and aural surgeon. Mainly this was owing to the more ready access to this locality, the excessive suffering attending the acute cases and the graver complications of meningeal and other dangers to life of the chronic ones, for which relief and curative measures, such as could only be rendered by surgery, became imperative.

As a result of the painstaking labors of many in the practical field of surgery, more accurate clinical and pathologic knowledge, all led and stimulated by the suggestions

of Professor Schwartze of Halle in Germany, we have at the present time, for this region, a most practical and eminently successful surgery, both so far as method and technic are concerned.

With special emphasis the same statement applies to the diseases and surgery of the maxillary sinuses. The brilliant achievements of dental surgery are so well known that further reference is unnecessary.

The lesions of the pneumatic spaces of the frontal, ethmoidal and sphenoidal bones are disclosed to us by the almost uniform presence of characteristic symptoms on the part of the walls of the orbit, its margins or contents; and even if these uncommon cases have not attracted more general attention, they nevertheless belong to the province of ophthalmic surgery.

Unfortunately these cases have not received, even from the majority of opththalmic surgeons, the attention they deserve, and only those unmistakable examples of disease in which these cavities become the retention-cavities for pus, larvæ, microorganisms or tumors, were the indications for rational surgery looked upon as imperative, and even in such cases unnecessary delay was oftentimes resorted to.

Surgical interference of some kind almost forced itself upon the surgeon unless, as not infrequently happened, he looked on until, after months of tedious suffering, fistulous openings with spontaneous exit of the retained contents of the choked sinuses resulted. In other cases more successfully managed, surgical interference ceased with the evacuation of the contents of the distended cavities, and, relief from suffering once accomplished, no further interference was thought necessary. Only in exceptional instances was a more complete method adopted which had for its object a more thorough exploration of the affected, and, if deemed necessary, also of the adjacent sinuses, for the better diagnosis of the real nature of the disease, as well as for more satisfactory irrigations or local treatment subsequently.

My own mistakes in diagnoses and the inadequate surgical measures which I formerly adopted have fully taught me the truth of this statement. My own experience forces me to say that many of the cases which are recognized as periorbitis, cyst of the orbit, caries of the margin, obstinate frontal and supraorbital neuralgias, etc., are in reality only the conspicuous manifestations of obscure chronic lesions of the frontal, ethmoidal and maxillary sinuses.

I have seen several instances of caries of the inferior margin of the orbit in which chronic disease of the maxillary sinuses was responsible for the orbital lesions, and which disappeared after an opening made from the mouth, along the canine fossa. One case was a child with periorbitis of the lower margin of the orbit, followed by caries, in which by accident later a fistulous opening in the month was discovered, that was enlarged at once along the canine fossa, the pus evacuted and the sinus drained, followed by rapid subsidence without further treatment for the orbital lesion.

I recall to mind a number of cases of periorbitis or periortous orbitæ, in which I was satisfied to evacuate the pus only and resort to packing and irrigation, and they were all unsatisfactory. Such cases were not cases of localized periorbitis, or periorbitis at all, but were really cases of disease of the frontal and maxillary sinuses, followed by spontaneous perforation of the bony wall, with detachment and bulging of the periorbital covering, appearing under the clinical picture of a localized periorbitis, the real nature masked because of the well-known latency of more positive manifestations of sinus disease in this region. In the cases just referred to an exploration of the frontal or maxillary sinuses would disclose the origin and cause for the periorbitis and caries of the margin.

Periostitis of the margin of the orbit in which traumatism can be excluded, is one of the rarest lesions; in the majority of such cases the lesion is situated in one of the accessory air-cavities referred to.

The so-called cysts of the orbit, in particular those met with in old persons, in whom a syphilitic history and catarrhal rhinitis with polypi of the middle or superior regions of the nose are found, are not cases in which the cyst develops in the orbit, but are uncommon expressions of disease of the ethmoidal cells or sinuses.

The deformity in these cases resulting from displacement of the eye is pronounced, and the periorbitis is often so tense that a solid tumor may be inferred. Another feature of these cases is that pressure against the protrusions which cause the proptosis is often followed by vertigo. The region of the anterior ethmoidal cells and the sinuses of the superior walls in the proximity of the *lamina cribrosa* readily explains this. This was especially instanced to me in a case of extensive epithelial cancer of the orbit and pneumatic sinuses of the skull in which it became necessary to explore and open not only the frontal and maxillary sinuses but the ethmoidal cells and sphenoidal sinuses. In this case pulsation of the thin floor of the brain cavity was distinctly visible.

In another case of extensive sinus disease with the growth of an exostosis within the sinus, pressure against the bony protrusion caused syncope at once. The operation in this case disclosed a large exostosis of the right frontal sinus and extensive implication of the ethmoidal cells.

Another instance of erroneous diagnosis, to which I have referred, is inveterate neuralgia of the frontal and infraorbital regions. These cases are identical with those met with in the ear and referred to as neuralgia of the mastoid. Uncontrollable neuralgia of this region when all other causes are eliminated may be due to disease of the pneumatic cavity of the frontal or maxillary sinuses, and relief can be afforded by and through surgery alone, *i. e.*, the opening of the sinus, and not, as is often advised and practiced, by division and resection of the supraorbital or infraorbital nerves.

It is the surgical methods applicable to these obscure pathologic invasions of the pneumatic cavities, marked by interminable chronicity and uncertain symptomatology and etiology attended by sequences or complications, which comprise a number of distinct pathologic processes to which it is my main purpose to refer.

Our knowledge concerning the purpose and functions of these pneumatic cavities has made no advance. We are as much in ignorance concerning their real purpose as ever, but we have acquired valuable practical experience concerning pathologic conditions, immediate or remote, resulting from various causes, a more accurate symptomatology and certainly more satisfactory indications for surgical treatment than formerly. These remote sequences of chronic sinus disease comprise fistulous openings, tortuous tracts appearing in remote localities from the seat of the lesion, as, for instance, on the side of the neck, as a result of a lesion in the pneumatic cells of the temporal bone at the inner, upper, lower and inferior margin, and even at the extreme outer margin, as the result of disease of the frontal sinus, lateral displacement of the globe or proptosis with formation of a firm tumor as the result of a disease of the ethmoidal sinuses due to the retention and perforation under the periorbita of the glue-like contents of these cavities. With lesser frequency are met chronic empyema, hyperostosis, exostosis, periostosis, and the growth of osteophytes or exostoses; rarefaction of these cavities with dilatation in exceptional cases to enormous proportions; contraction of these spaces either confined to one or several, or, as observed in those rare cases of Leontian's ossea, affecting all alike. The real advance and greater perfection of the surgery of the accessory cavities of the skull dates from the time that the old-fashioned drills and trepination instruments were exchanged for the chisel and mallet. It is, as already stated, to Professor Schwartze and his followers in Germany that we are mainly indebted for the rapid and bril-

liant advance in this department of aural surgery, which concerns the pneumatic spaces and mastoid antrum of the temporal bone, and also the graver complications of middle-ear disease. The more infrequent complications, *sinus thrombosis*, subdural cholesteatoma, etc., formerly unrecognized, or at least not relieved by surgical means with the same ease and thoroughness as at present, are all embraced in the scope of one of the simplest and most successful surgical methods, and its technic rendered easy and safe by the selection of the instruments referred to. The surgery of the pneumatic spaces of the temporal bone is so thoroughly understood, and the same statement applies to the maxillary sinus, that they are referred to only because they serve also as the model for the surgical treatment of the accessory cavities of the frontal, ethmoid and sphenoid bones. My own experience prompts me to suggest and to emphasize the necessity of the same thoroughness in diagnosis and the same prompt and painstaking attention in surgical methods for these obscure lesions of the ethmoidal, sphenoidal and frontal sinuses, both for exploratory diagnosis and curative purposes.

The *sinus frontalis* is certainly easy of access. Many of its chronic lesions are obscure and unaccompanied by positive clinical evidences, and exploratory operation can alone disclose the real nature of such lesions, and it is certainly justified. The external opening must be preferred to the uncertain one of attempting to find the intranasal opening of the infundibulum and of resorting to ineffectual attempts to explore or bring about drainage along this channel. This passage can be restored far more easily from above when once a large and roomy opening into the sinus has been made from without, and which at the same time gives positive information concerning the contents, dimensions and the state of its mucous lining. The operation can become expedient to relieve hyperostosis and the growth of osteophytes, as well as to prevent rarefaction of the cavity with

desiccation of its mucous lining, or, in rare instances, contraction with subsequent obliteration of the cavity, in consequence of sclerosis affecting both layers of the bone.

The ethmoidal and sphenoidal sinuses are not so accessible, but the external method is in all operative procedures for exploration, curettage or other interference, to be preferred to attempts to reach these cavities through the nasal cavity. I have long since abandoned such attempts and rely mainly on the external operations. In every case of ethmoidal disease I make a free incision over the frontal sinus, and this is carried well down on the side of the nose along the internal border of the tear-sac. The soft parts divided and hemorrhage arrested, the periosteum is detached and the tear-sac pushed to one side. The *sinus frontalis* is then explored, whether found normal or otherwise; its vertical depth is determined and a point externally which corresponds to it is selected and marked. In a region between a point which marks the floor of the frontal sinus and the border of the tear-sac, I perforate the external wall with chisel and mallet, carefully penetrating, with the inner orbital wall as a guide, in a slightly downward direction, until I reach the anterior and middle cells. With greater caution along the same course the sphenoidal cavity may be explored. I have done this but twice (exploration of the sphenoidal sinus), once for extensive epithelial carcinoma of the orbit and face, which had withdrawn its activity from the surface structures to the accessory sinuses. All were involved and the case terminated fatally. In another case the most marked rarefaction of the frontal, ethmoidal and sphenoidal sinuses was found. Two weeks after the operation it required two yards of iodoform gauze 1½ inches wide to pack these cavities, which may convey some idea of the enormous dilatations.

CHAPTER IX

OTOLOGY, RHINOLOGY AND LARYNGOLOGY

NOTES ON SYPHILITIC LARYNGITIS, WITH CASES

BY HOWARD S. STRAIGHT, M. D., CLEVELAND

Case I. In May 1897 a German male, aged 45 years, was referred to me because of a throat affection. He gave a history of a slight hoarseness, cough and recently pain on deglutition. All his symptoms had grown worse within a short time. A laryngoscopic examination revealed a fairly typical picture of syphilis of the larynx. He gave no history of specific disease, nor did he give evidence in any other part of the body of having syphilis. While the laryngeal appearances inclined me to believe that the case was one of laryngeal syphilis I could not be sure that it was not a carcinoma of the larynx. An examination of his chest revealed nothing. This fact practically excluded the possibility of the laryngeal disease being tubercular, and the diagnosis lay between syphilis and carcinoma. I determined to prove my position therapeutically. I gave the patient a note to his family physician and requested him to put the patient upon mixed treatment, suggesting that the dose of the iodid should be five grains every two hours for four days and then ten grains four times a day, after that time until I should see him again. In ten days I saw the patient for the second time. The laryngoscopic appearance of the larynx had not changed. He also reported himself as feeling no better. How thoroughly the patient had taken his medicine I could not decide. He made great complaint of the medicine and scouted the idea of his having any such disease as I had suggested. Again I requested the family physician to con-

tinue the mixed treatment but to increase the dose of the iodid.

I did not see the patient again for about three weeks. At this time he was worse than at either of the previous visits. The laryngoscopic appearances of grave disease of the larynx were more marked than in the beginning. The ulceration of the larynx had spread. I questioned the patient closely as to the way in which he had taken his medicine. I strongly suspected that he had not carried out the instructions as given. However I also questioned my diagnosis and again considered the possibility of my dealing with carcinoma of the larynx. The patient still made great complaint as to his medicine. At this visit I told him he had one of two things—either syphilis of the larynx, as suspected in the beginning, or cancer; that I suspected that he had not taken his medicine as directed, possibly that the dose given was too small. I succeded in convincing him that the time for radical treatment had come. I wrote the prescription I wished him to take, and enclosed it in a note to his family physician. I increased the dose of the potassium iodid. In ten days he returned. He had taken the medicine as directed. The improvement in his condition according to his report was very great. The improvement shown by laryngoscopic examination was no less marked. From this time his recovery was uneventful.

Case II. In September, 1895, a woman aged forty years, a widow for fifteen years, presented herself at my clinic. Within the last few months she had lost flesh markedly. She was pale and anemic. She had a rapid pulse and a slight rise of temperature at two o'clock in the afternoon. She gave no history of specific disease. Eighteen months before coming under observation, she had for a number of months an inflammation and suppuration of the superficial cervical glands. At the same time she had had an inflammation of the right knee-joint and had worn a plaster-of-paris cast for a number of months. There was no evidence

to show that the true character of the glandular and articular disease had been suspected. There was no history of any injury to account for the inflammation of the knee-joint. The joint had entirely recovered. The suppuration of the cervical glands had also ceased and there was no enlargement of the remaining cervical glands, or anything characteristic about the scars in the neck except their presence. The examination of the urine showed nothing abnormal. The patient could breathe without difficulty when quiet, but upon any special exertion her dyspnea became marked. For a few months she had suffered from a progressive hoarseness, cough and pain in the larynx, and lately from dyspnea on exertion. An examination of the chest was made, but owing to the element added to the respiratory sounds all over the chest, due to the narrowing of the glottis, it was impossible to decide accurately, as to the condition of the apices. No markedly abnormal condition could be found and yet whether a slight consolidation was not present could not be decided. Nothing of diagnostic significance could be found in the upper air-passages above the larynx. The examination of the larynx showed a marked thickening of the true and false cords and mucous membrane at the head of the larynx. The arytenoids were much enlarged and there was also much thickening and infiltration of the interarytenoid space. There was no ulceration present. Because of the absence of ulceration and because of the thickening being equally distributed on each side of the larynx the exclusion of carcinoma of the larynx was easy. The characteristic anemia of the larynx in a laryngeal tuberculosis was not present, but, in spite of this fact, the disease of the knee-joint, the suppuration of the cervical glands, the absence of any other diagnostic symptoms in favor of syphilis, the absence of ulceration in any part of the larynx in spite of the symptoms that in greater or less degree had existed for months, the marked loss of flesh and general anemia prejudiced me in favor of tuberculosis of the larynx.

However, I recognized the fact that the case was not typical, and that if the condition of the larynx was a tubercular one a marked pulmonary tuberculosis would theoretically be present. Although suspecting that the case was one of tubercular laryngitis, I recognized the possibility of its being a syphilis of the larynx or possibly a combination of each condition. I gave the patient small doses of creosote, bichlorid of mercury and moderate doses of potassium idodid. In four days the patient returned. The condition of the patient was the same as when first seen, except, possibly the dyspnea on exertion was slightly less marked. The patient herself was in doubt as to her being any better. The treatment was continued but the dose of the potassium iodid was increased. Upon her third visit, that is, in eight days after beginning treatment, the patient was improved, and I began to waver as to my diagnosis. The treatment adopted in the beginning was continued for a short time. Upon the disappearance of an evening temperature, and after proving that no tuberculosis of the lungs existed (such decision being possible when the respiration became less noisy from laryngeal obstruction) the creosote was discontinued. The recovery of the patient from this time was uneventful.

Remarks on Case I

Remarks on Case I might be summarized by saying: Never accept the diagnosis of carcinoma of the larynx until proved therapeutically. The same statement could wisely be made as to any new growth in connection with the upper air-passages.

Remarks on Case II

Possibly the color of the larynx ought to have been sufficient evidence that the disease with which I was dealing was not tuberculosis. The absence of the ulceration although the disease was of months' standing puzzled me. Ordinarily gummata of the larynx break down rapidly. However, this is not the invariable rule. As in the case re-

ported gummata may exist in the larynx for months and yet no breaking-down occur. If a history of specific disease could have been obtained this evidence would have been of value; however, I have for years been impressed with the fact that a very large proportion of the cases of syphilis of the upper air-passages give no history of having had specific disease. The fact of the patient having no pronounced tuberculosis argued strongly against the laryngeal condition being tubercular, yet the signs in pulmonary tuberculosis are not always marked. Laryngeal tuberculosis may be primary. However, I have never seen such a case, and only a very few are on record. The lungs have, in every single case of tuberculosis of the larynx passing under my observation, shown at least slight evidence of disease. I remember one case of tuberculosis of the larynx considered tubercular in the beginning and proven to be such by long observation in which for a number of weeks no evidence of pulmonary disease could be found, not even transference of heart sounds. The patient had however a slight fever and slight rapidity of pulse and had lost flesh and strength. Six weeks after the diagnosis of tubercular laryngitis had been made the signs of the same disease in the lungs were first detected.

General Remarks

The four conditions of the larynx, most often requiring differentiation in a given case, are lupus, carcinoma, syphilis and tuberculosis. Lupus of the larynx ordinarily attacks this organ secondary to cutaneous lupus. As a rule it attacks the epiglottis first. It is characterized by a slow but progressive destruction of tissue. If there is any question as to its being syphilis in a given case it can be easily settled by administering increasing doses of potassium iodid. If the diagnosis lay between carcinoma and lupus the microscope might have to decide the question. Carcinoma of the larynx is a rare disease. While carcinoma may attack any part of

the larynx it ordinarily attacks the ventricular bands first. The diagnosis by the aid of the microscope is as a rule easy. In certain cases the diagnosis ought not to be made positively until the patient has been subjected to increasing doses of potassium iodid. Tuberculosis of the larynx is a common disease, and the anemia of the larynx, the pear-shaped condition of the arytenoids, the swelling of the interarytenoid space, the associated pulmonary tuberculosis ordinarily make the diagnosis of the laryngeal condition easy If any question exists in the mind of the laryngologist the administration of increasing doses of potassium iodid will easily exclude specific disease. Syphilis of the larynx is a common disease. If mistaken for any one of the other diseases mentioned, and increasing doses of potassium iodid are not administered the results may be deplorable. Such medication can in no event do great harm. In lupus or carcinoma its administration for a short time is a matter of little consequence. In laryngeal tuberculosis anything tending to disturb the gastrointestinal tract would be undesirable and yet if any doubt as to the condition of the larynx exists the administration of the remedy is extremely valuable. Again laryngeal tuberculosis and syphilis of the larynx may occur together. In such a case the increasing doses of potassium iodid ought certainly to be given. Theoretically the diagnosis of the conditions mentioned is easy; however, certain cases occur in which a positive diagnosis cannot be made. Then the therapeutic procedure mentioned in this report becomes valuable.

DISCUSSION

Dr. J. A. Thompson, Cincinnati: There are two or three points in syphilis of the larynx that seem to be of particular importance. The worst cases it has been my misfortune to encounter have been in those who contracted it innocently. I can recall two cases of young girls, pure girls, who contracted it by kissing men having lesions on the lips.

One, seen early in my practice, was the most severe I have ever treated. Another, a recent case, brought to me less than a month ago, had resulted in partial destruction of the epiglottis. Careful questioning showed the probable origin of the disease. There was a definite history of a peculiar ulcer on the lower lip that was slow in healing. The patient has since lost her hair and had a secondary eruption making the diagnosis absolutely certain.

I have seen two cases in men. One was in a man who smoked a pipe another man had used. In the other, an accidental exchange of cigars, had resulted in a chancre of the lower lip. Syphilis contracted in this way about the mouth, is apt to be severe in its laryngeal manifestations. The patients protest there can be no syphilitic disease.

Dr. Mary J. Finley, Mansfield: I have noted the very thing of which Dr. Thompson speaks. A young girl of whose purity I had no doubt, came to consult me. She was suffering with a marked case of syphilis of the larynx. I was fresh from the clinics at Vienna and had seen a great deal of that trouble there, so felt sure of my diagnosis. Shortly after the patient went out, my uncle who was my partner also, came into my office and asked me the trouble. As I wanted to consult him, I said, "It is the most astonishing thing, that girl has syphilis of the larynx:" My uncle replied that the reason he asked was because he was treating for syphilis the young man to whom she was engaged to be married. There were mucous patches in the mouth and the young man was frantic when told the trouble, and that he must be careful or he would infect his future wife. The young woman never showed any further signs of syphilis and made an apparently complete recovery. She married the young man later and they are the parents of healthy children.

Dr. G. W. Morehouse, Sparta: Is syphilis curable? The parents of healthy children! Is this case cured? How long since it was cured? Did it remain cured? Will it remain cured?

Dr. H. J. Herrick, Cleveland: I want to ask a question, about the therapeutic tests of syphilis. We have a theory that mercury and potassium iodid are specific anti-

dotes. We regard these substances as tests of the question of syphilitic trouble. I am glad to have heard this paper, and present this suggestion: Is the mercury and iodid treatment to be regarded as diagnostic as to the nature of the disease? Are we prepared to say this and defend it?

Dr. Straight, in conclusion: The question of the curability of syphilis is an old one. It is generally recognized that it can be cured. The fact is, we see patients who did not take the medicine when they had the primary lesions. We see cases who start out vigorously in treatment and then stop in a few months, and finally, after years, develop some obscure disease. I think this is the reason some men get it into their heads that syphilis is incurable. I think some men get well and have families of healthy children. I think it is recognized the world over that potassium iodid is an antidote. In my mind there is no doubt about it.

BILATERAL PARALYSIS OF THE POSTERIOR CRICO-ARYTENOID MUSCLES OF THE LARYNX, WITH REPORT OF A CASE

BY ALBERT RUFUS BAKER, M. D., CLEVELAND

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Although the literature of bilateral paralysis of the adductors of the larynx is more extensive than that of any other laryngeal neurosis, the number of cases reported is small. Indeed it is a rare disease. The case I wish to report is the only one I have ever seen. A cursory examination of the literature at my command leads me to think that not more than fifty cases have been reported. Cases must have occurred before laryngoscopic days, but were never recognized until comparatively recent times.

I was called in consultation with Dr. J. Perrier on the evening of November 7, 1895, to see Mr. A. J.————, aged 42 years; superintendent of a large manufacturing es-

tablishment. Married; no children. Always enjoyed good health with the exception of the ataxia, and no specific history, although he has led a somewhat irregular life and during his youth had probably had sufficient opportunity to contract specific disease. Mr. D. has been under the care of Dr. Perrier for several years for posterior spinal sclerosis. Has complete absence of knee-jerk; is unable to stand with his eyes closed; obliged to walk with a cane, and has severe lightning pains in the legs; a feeling of a tight band around the abdomen, and typical Argyll-Robertson pupil; no atrophy of the optic discs. During the past year Mr. D. has suffered repeated attacks of dyspnea, usually coming on suddenly after some unusual expiratory effort, either in sneezing, coughing, laughing, hiccough or shouting. At first the attacks were rather infrequent and were not so severe, but during the last two or three months they have been occurring almost daily, and sometimes two or three times a day.

During the attack there seemed to be no obstruction to expiration, but the most violent efforts at inspiration were made, the eyes becoming fixed, the lips and face purple. Normal respiration was only restored upon his fellow-workmen placing him upon the ground, rolling him over a barrel "walking all over him" to quote his own words. These attempts at artificial respiration were usually successful in a few minutes, sometimes requiring half an hour, after which he would return to work as though nothing had happened. His speaking or singing voice was not affected.

A laryngoscopic examination showed the vocal cords, when at rest, to be slightly separated; it would seem scarcely enough to permit free respiration. During phonation they closed normally, but during respiration they did not separate widely so as to form a triangle as they do in health.

A diagnosis of paralysis of the posterior arytenocricoid muscle was made, and it was suggested that he go to the hospital and have a tracheotomy performed as soon as possible.

He was admitted to the Cleveland General Hospital on the next day, and on the morning of November 9, an attempt was made to administer a general anesthetic, but resulted in an immediate interruption of respiration, so that the general anesthetic was discontinued and tracheotomy performed under cocain anesthesia. There was no special difficulty met with in the operation, and the patient made an uninterrupted recovery, and immediately returned to his occupation, which he has followed up to the present time with scarcely the loss of a day.

He wears the tracheotomy tube constantly, with a cork in it, tied to a string. Whenever one of these suffocative attacks comes on he pulls out the cork and normal respiration is immediately restored, he then replaces the cork and soon goes on about his work as usual. His wife tells me that these attacks occasionally come on in the night, when he pulls out the cork and replaces it without waking. The ataxia has apparently remained stationary—no better, no worse. A few weeks ago he secured a life insurance policy for $2,000, in an industrial life insurance company.

During the first year after the operation he had some difficulty in securing a satisfactory tracheotomy tube; they would break and get out of repair, and it became necessary to have a new one at short intervals, and they were also hard to keep clean, and from their irritating properties would frequently cause excessive granulations to spring up around the tube; so that we replaced the metal tube by a soft-rubber one, a sample of which I present to the Society. I am indebted to my colleague, Dr. George W. Crile, for the suggestion as to using soft-rubber tubes instead of those of hard rubber, or of metal as hitherto. I have never yet met a case in which they have not given better satisfaction to the patient as well as myself, and I believe that they should come into more general use than the older style tubes which have been in use since time immemorial.

As to the pathology of these cases there has been considerable diversity of opinion, some authors maintaining that the disease was a local one, probably due to an injury of the posterior cricoarytenoid muscles from swallowing fish-bones, artificial teeth or other hard substances. Others have reported cases due to lesions in the course of the recurrent laryngeal nerves, such as aneurism and tumor. The more commonly accepted explanation of this exceedingly interesting and curious malady, is that of a morbid condition of the nerve-centers.

It is probable that a more careful postmortem examination of tabetic patients will demonstrate that the opening of the glottis is presided over by an independent ganglionic center in the upper portion of the medulla, and degenerative changes of this center like those of the posterior columns of the cords, or the optic nerves, will be recognized as the pathologic lesion in the vast majority of these cases.

I am quite willing to concede in view of the clinical evidence already accumulated that there are other etiologic factors which must not be overlooked in these cases, such as pressure on the recurrent laryngeal nerves, hysteria and traumatism of the posterior cricoarytenoid muscles.

DISCUSSION

Dr. Kinsman, Columbus: This case has three features which should be noticed.

First, the patient is tabetic. Second, the paralysis. Third, the paroxysms of suffocation.

Tabes and paralysis are not unusual, but, so far as my experience goes, laryngeal crises are quite uncommon.

Crises of the stomach, bladder or genitals, as well as crises of the larynx are characteristic symptoms of tabes. Charcot and his school have reported many such cases. The distress in the case under consideration is not due to the paralysis, but to an irritation which has its origin in the sensory nerves.

Paralysis is a continuous symptom in this case, the suffocative attacks come at intervals.

This is a very good illustration of laryngeal crises in tabes.

If I were to name the case I would say it was paralysis of the vocal cords with tabetic laryngeal crises.

Dr. P. J. Kline, Portsmouth: As my friend, Dr. Kinsman, has remarked, there are some points in the case reported by Dr. Baker, that I do not understand, and I do not know that I should have taken time to try to understand them. The most interesting thing to his patient was to get some wind. When his wind was cut off, the matter of living became quite a vital point with him. What interested me a great deal in his paper was the manner in which this relief was given him, since he had to wear a tube permanently. I met, sometime ago, a patient under somewhat the same condition. I found an adult with a tracheotomy tube in his throat. It happened to be a double one, and I removed part of it at first and soon got the man resuscitated. He continued to wear it a number of years after I visited him that night. I do not believe he wore any cork in the tube, for he needed about all the air he could get. When he wanted to talk, he would place his finger over the tube, for you know our conversation is carried on with the expired air. These cases, that are obliged to wear metallic tubes, are liable to have some difficulty in the region of the tube, due to its pressure and its constant presence on the inside of the trachea against the soft membrane there. I think the tube suggested by the Doctor is well worthy of consideration. I do not know what finally became of my patient.

Dr. A. R. Baker, Cleveland, in closing: I might say there has been considerable discussion with regard to these cases. Some German authors have insisted, and do still insist, I believe, that it is a spasmodic difficulty and not a paralytic one. But anyone who has examined a case and watched it as I have this one, two years and a half, would certainly entertain a different opinion. I suppose I have examined him with the laryngoscope fifty or more times, and I have never seen the vocal cords separate more than a quarter of an inch. You know the vocal cords naturally open up three-quarters of an inch, but these are parallel and nearly immovable in that position. He never has this difficulty of respiration unless he does something that gives

extra effort to the chest, such as laughing, hiccoughing or coughing. He is not relieved until he pulls out the cork, and then is relieved instantly. I think the anatomic construction of the larynx explains this. You can take the larynx, bring the cords together and it will hold water as tight as the aortic valves. Ordinarily they are separated slightly so the patient breathes along without any trouble, but when the amount of air is slightly reduced below, then they are closed up and are fixed in that position. These patients die in these attacks. When one has seen a patient at one of these times, he will be surprised that they live as long as they do. They will wear these tracheotomy tubes a long time. Doctor Cohen, of Philadelphia, I believe, has reported a case where a man has worn a tube 24 years, and a number of cases have worn them ten or twelve years after the tube was inserted.

INFECTIVE INTRACRANIAL COMPLICATIONS OF AURAL DISEASE—PROGNOSIS AND TREATMENT

BY ANDREW TIMBERMAN, M. D., COLUMBUS

Since the chief complications of aural disease occurring within the cranial cavity are of such recognized seriousness, it is with not a little trepidation that the writer places himself on record as looking at them from a somewhat optimistic point of view. This trepidation is enhanced by the impression that the general profession has heretofore received with some reluctance the suggestion of operative treatment of the aural disease as a prophylactic procedure. Yet greater reluctance is manifested to the measures proposed in the treatment of some of the complications, especially meningitis. But let us not forget that the great advances in medicine have been made by men who have never ceased to hope for and attempt the cure of affections which hitherto had been considered incurable. Vaccination was with difficulty introduced; laparotomy was at first combatted, and

in fact nearly every radical advance has been compelled to maintain its right in the face of the most violent opposition.

Aurists are now having their turn at the wheel of difficulty in securing the recognition of the importance of certain aural affections and their sequelæ and in having measures adopted for their prophylaxis or cure. The chief of these complications are meningitis, abscess and sinus thrombophlebitis. All are of infective origin and represent the result of the dissemination of organismal peccant matter from a primary focus of pyogenic infection, situated usually in the middle ear. But consideration of either the prognosis or treatment to which this paper is confined, is so intimately connected with the etiology that a discussion of the one to the exclusion of the other is neither practical nor desirable.

It must be clear to everyone that an infective disease which owes its increasing dangers to a primary focus must in time terminate fatally unless the causative element be eliminated. In each of the above complications there is a time when the removal or cure of the primary aural disease would result in the cure of the sequela, or at least prevent its threatened materialization. To admit this much, brings them at once into the category of preventable diseases, and stamps their prophylactic treatment with the greatest importance.

As to just when the primary aural disease, and this is usually a chronic suppurative effection, seldom an acute one of any character, will pass its local boundaries and invade the cranial cavity, no one may estimate. The danger of bacterial invasion of the encephalic tissues depends upon the virulence of the infection, the conditions for the growth and development of the specific agent, and the susceptibility of the invaded tissues or structures to the influence of bacteria. In the middle ear all the conditions are favorable to germ growth and development. Once safely landed in the re-

mote air-spaces of this organ they are secure from the reach of local applications and readily multiply in the even temperature, and subsist on the rich pabulum thrown out by the limiting mucous membrane.

Given a carious or necrotic lesion in the middle ear and a perforated *membrana tympani*, an unobstructed discharge must be regarded in a favorable light; for the same lesion with obstructed outflow would speedily give rise to alarming symptoms, and death itself might occur from pus forced into the cranial cavity, or retained there because its outlet had, under the influence of treatment, or other cause, closed; for there is no doubt in my mind that apparently successful treatment of the aural disease may give rise to very grave and serious conditions, if one of the complications be present though not manifesting itself by any pathognomonic symptom. The following *precis* of a case is *apropos*.

M. W., a healthy, robust girl of 15 consulted me last September regarding a double suppurative *otitis media chronica* dating from an attack of scarlet fever when five years of age. After examination the parents were frankly informed that treatment would probably be useless without an operation. This was refused and I was engaged to treat the case as best I could without surgical intervention. On December 8, 1897, the right ear was dry, the first time in ten years, and remained so until January 24, 1898, on which day patient came into my office flushed and excited, suffering intense pain radiating over whole right side of the cranium, dizziness, temperature 103°, coated tongue, anorexia, and most obstinate constipation. January 27 the whole condition of the patient changed. A most profuse discharge set in, the pain ceased, temperature became normal, obstipation was relieved, appetite returned, and no inconvenience apart from the discharge vexed her. The quantity of pus, non-involvement of the mastoid, high temperature, intense pain and obstinate constipation, leave no doubt in my mind that the outlet of an epidural abscess had,

FIG. I—RIGHT TEMPORAL BONE

Illustrating the "typical" or original Schwartze operation for opening into the mastoid antrum.

1. Squamous portion of temporal bone. 2. Linea temporalis. 3. Mastoid process. 4. Zygomatic process. 5 and 11. Glenoid fossa 5. for condyle of lower jaw. 11. for parotid gland. 6. Styloid process. 7. Tip of mastoid. 8. External auditory meatus. 9. "Typical" or Schwartze operation for opening into mastoid antrum. 10. Wedge of bone left between external auditory meatus and artificial opening into mastoid antrum. Just to right of the number 10 is seen the spina supra meatum indicating the level of the antral floor. 0. Mastoid foramen.

under the influence of treatment closed, and that the gradually accumulating pus had occasioned the alarming symptoms, which were only relieved when an opening had again been forced for the pus.

A thorough knowledge of the tendency of primary aural disease to induce these serious complications, and early detection of the latter, coupled with bold and thorough surgical treatment, are the cardinal points upon which to predicate a favorable prognosis. It will be much more serious when the proper treatment has been delayed, as it so often is, unfortunately, until the vital parts of the encephalon are invaded or the general system affected. But I wish to emphasize the fact that there is some chance for recovery in even the extreme cases. A cerebral abscess, unnoticed or neglected, may run its first stage, marked by cessation of the otorrhea, pain, vomiting, sometimes rigors, slightly accelerated pulse, and abnormal temperature, and pass into the second stage—in which, as a rule, the surgeon first sees it—marked by great prostration, dulled senses, slow cerebration, partial paralyses, optic neuritis, contracted pupils, slow pulse and respiration, subnormal temperature and obstinate constipation—and recovery may yet take place. Nay, more! Cases are on record and are more and more frequently reported, in which the clinical picture of a patient *in extremis* is presented; livid face, coma so deep that an anesthetic is not required during operation, hurried and shallow respirations, temperature 102°-104°, pulse 120-140, convulsions, tetanic seizures and dilated pupils—such cases as these even will sometimes recover after an operation and live to bless the surgeon who gave them the benefit of the only chance they had.

In these extreme cases when treatment is successful, the changes indicative of improvement come quickly. The temperature falls to or near the normal point, the pulse becomes steadier, fuller and slower, sensation returns, pupils contract, convulsions cease, and the mind becomes clear

and active. The optic neuritis persists some months but finally clears up leaving vision unimpaired.

The smaller the abscess, the more remote its location from vital parts of the encephalon and the presence of a capsule are favorable points in cases where an operation is neglected or rejected.

Sinus thrombophlebitis may, in very rare cases, as is proven by postmortem examinations, recover even without treatment, but the affection uncombatted usually runs a speedy course terminating in death. If taken early before the thrombus becomes infected and degeneration and disintegration take place with infarctions in the internal organs, the chances for recovery are good provided a thorough eradication of the morbid tissues is obtained. This procedure offers the only though distant hope in those cases where infection has passed into the general circulation and produced grave lesions in the internal organs, and should be resorted to.

The most frequent as well as the most fatal complication attendant upon aural disease is meningitis. It differs in no respect from the same affection referable to other causes except that it is more likely to be localized and is usually purulent. To the fact that it is often localized is due the favorable prognosis with which aurists are learning to regard this form of meningitis. Generalized meningitis of an infective purulent character no one regards as curable. But localized meningitis we do regard as operable with at least equal chances for recovery. With modernized methods of examination the medical fraternity is not so skeptical as regards the diagnosis of meningitis in a recovered case as it was ten years ago. Cases *do occur* and *do recover* whose clinical histories coincide with those whose diagnosis postmortem is meningitis. It is unfair to assert they are not. Besides it may be possible to demonstrate the pathologic condition during an operation.

Professor Macewen was the first to begin if not the first

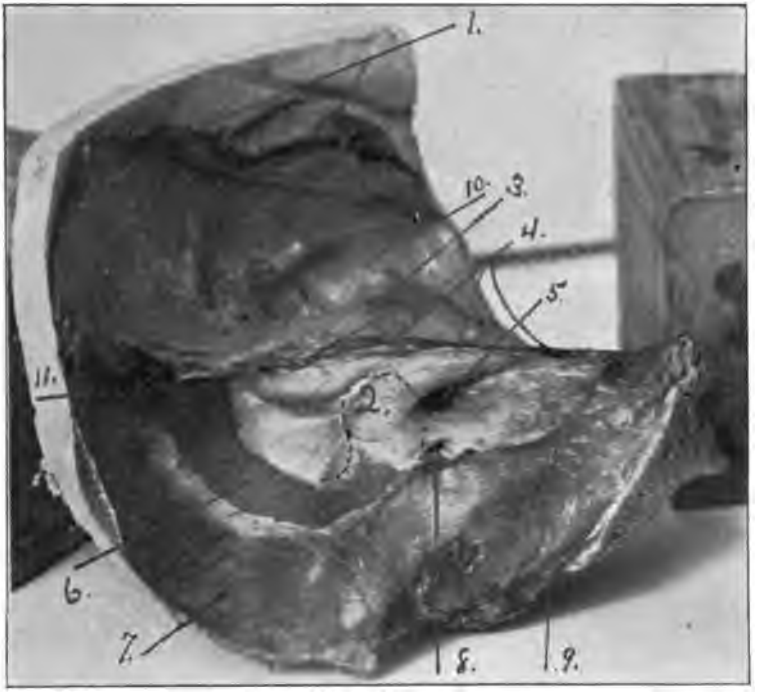

FIG. 2, LEFT TEMPORAL BONE, INNER SURFACE.

Dura mater in situ, demonstrating very beautifully the relations of lateral, sigmoid, superior and inferior petrosal sinuses.

1. Reduplications of dura mater. 2. Posterior surface of petrous portion of temporal bone. The dotted line shows position and form of the jugular bulb. 3. Eminence on anterior surface indicating situation of the superior semicircular canal. 4. Lines pointing to superior petrosal sinus. 5. Internal auditory meatus. 6. Sigmoid sinus. 7. Cerebellar fossa. 8. Jugular foramen. 9. Inferior petrosal sinus. 10. Lodges temporo-sphenoidal lobe. 11 Lateral sinus.

to suggest the operative treatment of meningitis and half of his cases recovered. Begun before the peccant infective material is widely disseminated throughout the cerebrospinal system, surgical intervention with this formerly invincible foe to the *ars medendi* will often insure its capitulation.

The treatment of infective intracranial complications of otitic origin is prophylactic and surgical—prophylaxis having as its aim the prevention of a primary focus of pyogenic infection in the aural apparatus of the temporal bone, and surgery its removal when found.

The family physician is, of necessity, the chief agent in the prophylactic treatment of these cases. He is first consulted regarding the acute otitides occurring as sequellæ of other diseases and upon his careful treatment of them will often depend their cure, and thereby the prevention of a chronic affection the most prolific causative factor of these intracranial diseases. He is, also, most frequently consulted regarding the chronic otitides themselves, and these should secure his most earnest attention as they supply the microbic organisms which incite the complications. Faithful service and attention should be given and an honest endeavor made to cure these by the usual methods. If after several months no improvement is noted, the patient should be informed of the seriousness of the affection and some measures adopted calculated to eradicate the infective nidus, for no one can know at what moment or under what conditions circumstances may rise which will result in the dissemination of the infective material throughout the entire cerebrospinal system or into the general circulation.

Surgical treatment consists in the removal of the ossicles, and in total or partial ablation of the mastoid as a cure for the primary aural disease, and as the first step in the surgical treatment of the complications themselves.

The frequency with which the ossicles are secondarily affected and the percentage of cases in which their extrac-

tion is found unavailing constrains the aurist to operate more and more frequently through the mastoid in order to eradicate the infective nidus, while the presence of one of the above complications demands the mastoid operation as the first step in its successful treatment. From April, 1895 to April, 1897, 219 mastoid operations were done in Professor Schwartze's clinic, while in the same period there were only 20 extractions of the two external ossicles, one-third only of which were done the second year.

The anatomic specimens* will demonstrate better than words can express just what should be accomplished in ablation of the mastoid and how it should be done. The following description is therefore purposely wanting in the scientific details of the operation as well as all forensic discussion of the relative importance of the anatomic structures and surgical procedures.

The partial ablation of the mastoid, though a surgical proceedure, is done as a prophylactic measure affording an outlet to the pent-up infective products, and thus preventing their dissemination inward with resulting intracranial involvement. In acute cases of mastoid involvement this will relieve the alarming situation and complete recovery will often result, but in the chronic cases where the lesion is situated deep in the middle ear, or where one or more of the above complications exist, total ablation† is necessary for the cure of either the primary disease or its sequelæ.

The partial operation has for its purpose the opening into the mastoid antrum and is the first step in the complete operation which has as its object the obliteration of the middle ear by transforming its numerous spaces into one common cavity.

The patient must be prepared as is usual for a major operation and a general anesthetic is necessary. Three assistants and a trained nurse are required. After the pre-

*Exhibit before the society. See illustrations.

†Here used synonymously with "radical operation."

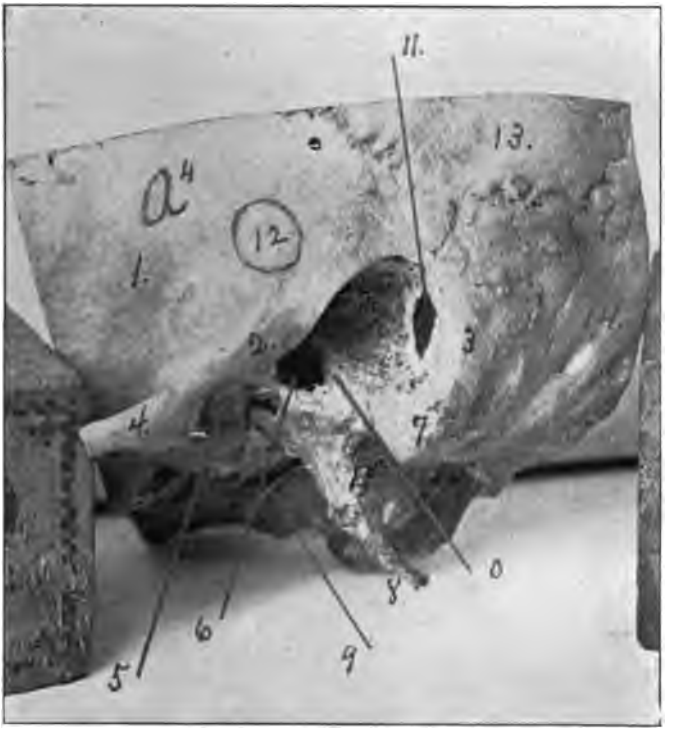

FIG 3--LEFT TEMPORAL BONE.

Demonstrates the "radical" or Schwartze-Stacke operation for conversion of the middle ear and external auditory canal into one common cavity. Indicated in most intracranial complications of otitic origin, in cholesteatomata of the middle ear, and often in otherwise incurable suppuration of the middle ear, accompanied by caries, etc.

1. Squamous portion. 2. Linea temporalis. 3. Mastoid portion. 4. Zygomatic process. 5. For condyle of lower jaw. 6. Tympanic cavity. 7. Tip of mastoid. 8. Styloid process bent inward. 9. Bristle passed through sigmoid sinus and having its exit from jugular fossa. 10. Ridge of bone left after chiseling away wedge of bone (10 in Fig. 1). This ridge is formed of compact bone and conceals the facial nerve. At the inner end of this ridge a rounded tubercle of bone is seen, which conceals the nerve as it changes its course outward and downward; here also is concealed the horizontal semicircular canal. 11. Sigmoid sinus exposed to view. 12. Point for trephining for temporosphenoidal abscess. 13. Parietal bone. 14. Occipital bone.

liminary curvilinear incision is made, all hemorrhage controlled, and *os planum mastoideum* well exposed, the ablation of bone is accomplished by means of a mallet and chisels. The two landmarks are the *linea temporalis* marking the inferior boundary of the middle cerebral fossa, and the *spina supra meatum* marking the level of the floor of the mastoid antrum.

In opening into the antrum several precautions are necessary in order to avert danger. The sigmoid sinus is usually so situated that sufficient room is afforded for the funnel-shaped opening to be made in the mastoid; often, however, it is so near the posterior wall of the external auditory meatus that it is impossible to proceed in the usual manner, but the posterior wall must be first removed. Wounding this vessel constitutes the greatest danger in the operation, though wounding the facial nerve, or penetrating into either the cranial cavity or internal ear structures is fraught with dangers and must be avoided.

On the completion of this first step in the operation there is simply the funnel-shaped opening into the mastoid antrum with a ridge of bone intervening between it and the external auditory canal. No encroachment upon the tympanic cavity, its contents, or the *aditus ad antrum* is made. If perforation of the *membrana tympani* be present, as is usual, irrigation of the middle ear may be practiced, but should be discountenanced as no one may say that an erosion of some portion of the osseous wall has not occurred exposing the membranes of the brain, and if this exists, irrigation increases the danger of pus finding its way into the cranial cavity. It is better, therefore, merely to cleanse with pledgets of gauze. To complete the operation, the opening into the mastoid is lightly tamponed with gauze, the periosteum is replaced, and upper and lower portions of the external wound sutured, leaving central part open to facilitate dressing and permit of drainage.

The operation just described is known as the "typical"

mastoid operation or the Schwartze method of opening into the mastoid antrum. Its success under given conditions has justified its application: its failure under given conditions has resulted in that more perfect procedure styled the "Schwartze-Stacke" or "radical" operation.

This is done as follows: After opening into the antrum, the membranous external auditory meatus is separated from the posterior wall, the ridge of bone is removed, as are also the hammer and anvil, and intervening and projecting spicules of bone; and the whole surface of the now single cavity of the middle ear made smooth and freed from carious processes. The posterior membranous wall is then slit up as far as the conchia, and then again at right angles to this, thus securing two flaps which are turned back to prevent cicatricial contraction of the meatus as well as aid in epidermization of the cavity. The cavity is then lightly packed with gauze, both from the meatus and posterior opening, stitches are inserted in the upper and lower angles of the latter and the head well bandaged.

Following this radical exenteration of the middle ear such measures as will relieve the complications will be resorted to. Epidural abscesses occur most frequently over the *tegmen tympani et antri*, or in association with sigmoid sinus affections in the cerebellar fossa, and are best relieved by removing the bone intervening between them and the new-formed cavity in the mastoid. Temporospenoidal abscess is best reached by trephining about one inch above the external auditory meatus, according to the rules laid down in general surgery. Cerebellar abscess is best attacked from the posterior and outer aspect of the sinus since the drainage is here better and the bone thinner. Of course the localizing symptoms in abscess will often be of paramount influence in the determination of just where an opening into the cranial cavity shall be made.

Localized meningitis occurs most frequently at those points near which extra- and intradural abscesses are wont

to be found and much the same surgical procedures are indicated, *viz.:* ablation of the mastoid and intervening bone, incision of the membranes and establishment of drainage.

Sinus thrombophlebitis is best attacked, after performing the radical operation, by chiseling away the mastoid until the sigmoid sinus is exposed. If this vessel be found thrombosed it should be slit up, its contents removed and the vessel packed with gauze. If the internal jugular vein be thrombosed at its upper extremity ligation of that vessel may be indicated, if possible, above its communication with the common facial vein so as to prevent a possible extension of the process by this channel to the ophthalmic veins and thence to the cavernous sinus. The writer once saw this occurrence.

If there is one point in the care of these cases worthy of special emphasis, that one point is the after-treatment. No operation in the whole domain of surgery which I can now recall demands as much special skill and experience to properly conduct the after-treatment as does the radical mastoid operation, and this statement will be best and most heartily attested by those who, after a ripe experience in general surgery, have taken up the special work in aural surgery. The operation done, the surgeon's work is only half done. To restrain excessive granulation, to guard against the formation of synechiæ, to prevent cicatricial contraction of the auditory meatus, and to secure complete epidermization of the whole cavity and yet retain or improve the hearing function presents a problem that none but the experienced should attempt; for be it understood that in a majority of these cases not only is it the concern of the surgeon to cure the local disease, but retain as far as practicable the special sense of hearing.

I may be charged with optimism in the consideration of the prognosis and treatment of these grave and serious lesions, affecting some portion of that cavity which contains the most vital parts of the human organism. But it is an

optimism born of a conviction which in turn is begotten by personal experience and observation as well as by study. Everywhere these cases are occurring because of the neglect of the primary disease and many a fatality supervenes because a pessimistic view prejudges a futile result and withholds the surgeon's hand when it might not yet be too late.

DISCUSSION

Dr. F. G. Stueber, Lima: I have one regret; that is, that this paper was not read before a larger audience. It is certainly an instructive paper, and I have enjoyed it very much. The Doctor has referred to the Stackey and Schwartze operations.

Dr. Timberman: Stackey enters it by chiseling away the posterior wall. Beginning at the internal edge of the external auditory meatus, he is able to get back into the antrum.

Dr. Stueber: Intracranial disease as a complication of ear disease is of more frequent occurence than was once believed. As we look back we wonder how cases remained unrecognized and neglected for so long a time; some of these patients have been treated under the supposition that they were cases of typhoid fever. I have now in mind a case that was under treatment for sewer-gas poisoning. When I saw her she was in the last stages of otitic brain disease; operation was not practicable, and she died in a few days. As to operative treatment the family physician is the one who first sees these cases and should advise operative treatment; otherwise it will not be done. Chronic otorrhea is commonly regarded with indifference, and does not receive the care it should have. Frequently the family doctor does not advise interference, and the case goes on until a fatal ending is the result. I think even in the later stages it is advisable to operate. When brain complications set in the patient is likely to die, and his only chances are in operative treatment. I wish to refer to another case which I have had under observation this winter and spring; here it was my misfortune to enter the lateral sinus. In the same patient I did the radical operation on the other ear

a year ago with good results. After entering the sinus the hemorrhage was so profuse that it was thought best to complete the operation at another time.

Dr. A. R. Baker, Cleveland: I have been very much interested in this paper and in the beautiful specimens we have had exhibited here, and regret the hour is so late and the attendance so small that we cannot enter into a more extended discussion of this subject. I am glad the Doctor has emphasized the fact that the condition is so frequently overlooked and a diagnosis made of malarial fever, typhoid fever, meningitis, and almost everything except the disease in question. Not long ago a patient was treated for several months by some of our best physicians for typhoid fever and the diagnosis was not questioned until there was an affection of the eyes and the oculist made a diagnosis of thrombosis of the cavernous sinus. These cases we meet with so frequently and usually they are so fatal that the diagnosis of the physician is not called in question, unless a postmortem is obtained, and we find where the ending of the case is so unusual the family physician often objects to a postmortem. My experience with meningitis in these cases has been rather unfortunate in that all the cases have died. I think, however, the difficulty is we have not had the opportunity to make the operation soon enough and the infection has caused a general meningitis. In cases of thrombosis I have been extremely fortunate, and the same is true of abscesses. The subdural abscesses have all recovered. In abscess of the cerebellum I have not been so fortunate. With regard to the choice of operation, I for sometime have been making the Schwartz-Stackey operation, the difficulties of the subsequent treatment have been so embarrassing that in ordinary every-day cases of mastoid disease I am going back and making essentially the old Schwartz operation, and I only reserve the Stackey operation for the more serious cases. I do not believe the radical operation, so-called, is necessary in the vast majority of cases.

Dr. Timberman, in closing: I wish to say in regard to these specimens that they were prepared with two instruments only; the mallet and chisel. I did not prepare them as I would were I to exhibit them as high-class handiwork, for then, as in an operation, I would use a sharp spoon to

remove all the little projecting spicules of bone and make the surface of the cavity smooth, thus facilitating the healing process. This is called forth by Dr. Baker's remark concerning the beauty of the specimens. Their chief service is to show how the operation should be done.

I am intensely interested in these cases, more, perhaps, because I have been permitted to see so many of them in all their different stages. Many I have followed to the post-mortem table, there to have demonstrated to me the extensive ravages of the primary disease and the indubitable connection between this and these intracranial affections. Such experience can only impress one with the very great seriousness of a chronic aural suppuration. It especially emphasizes the fact that these cases are neglected.

This leads us to the consideration of what should be done in those cases of aural suppuration which resist all ordinary methods of treatment. I would unhesitatingly advise an operation having as its aim the removal of the primary disease. And this advice would hold good at any stage of the disease except in beginning *rigor mortis*, for it is difficult to say when a patient is past redemption by operation.

As noted in my paper, patients have been operated upon when coma was so profound that an anesthetic was not required, when stertorous respiration, rapid pulse and temperature 104°-105° indicated approaching dissolution and yet they pulled through. While I do not believe that it is good practice for surgeons to bring an operation that might do a great deal of good into disrepute by numberless failures, I do feel that these patients have a chance even at the eleventh hour and should have the benefit of a late operation. With due care we can avoid bringing odium upon our profession by reason of our failures in these desperate cases. I would never forgive myself were one of my patients to die for whom I had neglected to advise this course.

The question as to whether the operation is fraught with danger is not pertinent, for of course it is. The administration of a general anesthetic alone will determine that; but the danger of an operation is in no wise to be compared to that ensuing upon a non-operative method of treatment for an otherwise incurable suppuration of the ear. This statement will not be denied, I judge, by anyone who has had considerable experience in these cases. The danger from intracranial complications, however, increases with the

age of the individual as statistics show that the greatest number of fatalities occur during the third decade of life, during which period longevity approaches its maximum. Ears may suppurate five, ten or even twenty years before a complication supervenes, or, of course, some intercurrent affection may be the cause of death. Absolutely no limit can be estimated.

In *sinus thrombosis* a very interesting question may arise in reference to the ligation of the internal jugular—when it should be done, how and where. It is not always necessary to ligate this vessel when it is affected in its upper *extremity*. If it is prominent and cord-like to the touch, if there is a high pulse and considerable prostration, the patient has better chances if you ligate. Two ligatures should be applied and the vessel severed between them. If possible they should be placed above the junction of the facial vein with the internal jugular to prevent the extension of the thrombus to the cranial sinueses by way of the facial and opthalmic veins. I saw this occur once.

Dr. Baker: I would like to ask Dr. Timberman one question. I know it is a general rule in our community for practicians to treat every case of suppurating ears by pouring in peroxid of hydrogen. Is that not considered bad practice?

Dr. Timberman: By some of our very best men it is. I must say, however, that I am not a very strong believer in the theory that the gas formed is a disseminator of the virulent germs, or rather that the gas thus formed adds much to the danger. I am sure I have cured some cases with $H^2 O^2$ where I could not have been successful without it. I think the routine practice of its use is bad. The normal saline solutions would be better; but there are cases in which its use by myself appears not only justifiable but obligatory.

I desire to thank the members of the Society for their kindness and their indulgence.

CHAPTER X

GENITO-URINARY AND RECTAL DISEASES

THE MODERN CYSTOSCOPE; ITS USE IN BLADDER, URETHRAL AND KIDNEY LESIONS

With a Practical Demonstration of Catheterization of the Male Ureter

BY B. O. COATES, M. D., CLEVELAND

Mr. President and Fellow Practicians:—It is not my intention this evening to dwell at length on the value of cystoscopic examination in vesical lesions, other than to pay a passing glance at some of the more important pathologic changes, with a general outline of the use of the modern cystoscope in vesical, urethral, and kidney lesions; yet we should not overlook the commoner diseased conditions and the valuable assistance often given in diagnosis by introducing the electric light within the bladder. Since our vision, or what we are able to see, plays such an important part in the recognition of pathologic changes occurring in other parts of the body, it becomes none the less necessary, when advisable, to take an actual view of the interior of the bladder, which will aid us in recognizing the true pathologic changes which occur in the vesical mucous membrane and enable us to watch the progress of the disease and the behavior of the same under varying forms of treatment.

*"Up to the date of the introduction of the electric illumination of the bladder all our knowledge of the obscure diseases of the urinary tract was obtained slowly and with difficulty, for it was acquired either by postmortem or by operative interference." Thus in many instances of early hematuria, with the exception of stone, the exact source of

* E. Hurry Fenwick, F. R. C. S, Electric illumination of the bladder etc.

bleeding was somewhat speculative, and indeed, in many cases, quite uncertain. The cystoscope, however, has been of the greatest value in aiding us to locate, frequently to our entire satisfaction, the exact source and cause of bleeding, and to modify in a great measure the significance of the appearance of blood in the urine occurring before, during and after micturition.

A glance at the table which Mr. Fenwick has so nicely arranged will show the difficulty often encountered and the frequent inaccuracy in diagnosing, without a cystoscopic examination, the source and cause of bleeding.

Patients come to us complaining of some urinary trouble, and after a careful study of their symptoms with a thorough examination of the urine, chemic and microscopic, how often we are left quite at sea as to the true nature and cause of their ailment, yet we are liable to overlook the fact that our clinical investigation is not complete until we have made an ocular inspection of the interior of the bladder. I consider such inspection quite as essential as the direct examination by illumination of the interior of the ear, larynx, eye, rectum, etc., in their respective lesions.

In certain conditions the diagnostic picture may be strengthened by an inspection of the lining membrane of the bladder by means of the electric light. Such conditions may be new growths, calcific incrustations, small shell-calculi left after litholapaxy, small stones and other foreign bodies, simple ulcerations, tubercular and early malignant disease, and such obscure conditions as prolapse of the ureters and vesical mucous membrane, or a small encysted stone held in a pouch or fold of vesical mucous membrane, which almost completely covers it, thus producing symptoms which may entirely mask the true local condition, and yet after careful examination of the interior of the bladder with a steel sound, nothing may be revealed, unless by mere accident.

I take the liberty of quoting one of Mr. Fenwick's cases

as an example, and to illustrate the value of the cystoscope in above similar conditions:

"A. P., æt 28, three years ago, being in perfect health and never having had any urinary disease or trouble, jumped off an omnibus while in motion and came with an unexpectedly sudden jerk upon his feet. He immediately felt a severe pain in the crutch, but by putting his finger in the perineum and pressing upwards he gained relief enough to walk home. The pain continued; his doctor sent him to a London hospital, and the surgeon under whose care he was admitted skillfully crushed a calculus weighing 368 grains. Fourteen days after the operation he began to be troubled with renal colic, and since then he has had repeated attacks. The attacks are very short in duration and occur once a day. Pain, not apparently of a severe character, starts in the left kidney and courses along the ureter to the testicle, which is drawn up. On examining the prostate I found the greater part of the interlobar line had gone, and my finger felt as though it would punch through the thin prostatic capsule into the prostatic urethra. I could feel the posterior surface of the pubes easily, and I had no doubt that a calculus had become encysted in the prostate, and the sudden jerk he had sustained in leaping from the omnibus had wrenched it from its bed and had thrown it out into the cavity of the bladder. I could see a deep prostatic pit with the urethroscope and was confirmed in my opinion. I was, however, quite unprepared for what the cystoscopic examination demonstrated.

"In order to ascertain the condition of the left ureter, preparatory to performing nephrolithotomy, I introduced the electric cystoscope and found the entire surface of the bladder in a state of subacute cystitis. After thoroughly washing I saw something which puzzled me greatly. Protruding and retracting from a small hole in the left side of the bladder, above the left urethral orifice, was a brown spike. I noticed it moved with respiration. It looked like

nd-martin projecting from the hole leading sand-bank or cleft. At first I felt certain sticking in the mouth of the ureter, and this xplained the presence of renal colic and the ab- bladder symptoms. On protruding my finger into ectum and examining the posterior part of the bladder, elt, high on the left side, a stony hard body in a sack, and knew at once that the spike I had been looking at was the nose of the encysted stone."

Mr. Fenwick says the curious part of the case is yet to come. "From the date of the cystoscopy and the thorough vesical irrigation the patient has been absolutely free from all symptoms of renal colic. He alleges himself to be cured. He reports himself to me every month or so, and I do not fail to examine this encysted stone. I am inclined to believe its weight had pressed upon and slightly obstructed the left ureteral orifice, the narrowing being increased by the swelling of the subacute cystitis, and that washing and sandal oil, by removing the latter, had removed the partial obstruction. Anyway this encysted stone is symptomless."

I myself saw a patient who had symptoms of stone, and after careful, repeated sounding of the bladder, no stone could be detected, but upon introducing the electric cystoscope a small calculus was seen to be lying imbedded behind the prostate, which was removed a few moments later without difficulty, after which all vesical symptoms subsided.

Prolapse of the ureteral or vesical mucous membrane around the urethral orifice is, fortunately, not a very common condition, yet when it does occur, and especially in female children, where it may even protrude through the vulva and tempt the surgeon to ligate it with lethal effect under the belief that it is a vesical growth." A beautiful specimen of such a condition is to be seen in St. Bartholomew's Hospital Museum, No. 2,367, Path. Trans., Vol. 14, page 185.

A very interesting case of the above is that of Caille's,

which is described in the *"Inter. Jour. Med. Sciences,"* May, 1888, page 481. A prolapse of the inverted lower third of the right ureter through the urethra of the female child was discovered after a severe fit of crying. This prolapse was apparently owing to the formation of a warty or papillomatous growth, the size of a pea, in the right ureter near its vesical insertion. The protrusion was ligatured, and the child died twelve hours afterward. Extensive renal disease was discovered on postmortem. No cystoscopic examination was made.

That the diagnostic range of the modern cystoscope is not confined to diseases of the bladder, but extends in many cases to those of the kidney with considerable exactness, is an established fact. Not only are we able with its help often to localize the seat of the trouble—†"negative vesical evidence giving a positive diagnosis of renal disease"—but also to distinguish whether there be two "working kidneys" or whether one or both be affected.

It may be said that the cystoscope fails under certain conditions. To some extent this is true, but by keeping in mind three essential points necessary for its employment we may overcome difficulties to a great extent which would otherwise appear to obstruct its use.

1. It can rarely be passed without undue violence in patients with irregularly enlarged prostates and when the prostatic canal is very devious, as blood becomes smeared on the windows and mixed with the urine in the bladder. An ordinary enlarged prostate offers but little resistance.

2. In stricture of the urethra. This should be dilated or cut. If the meatus is too small to admit of a No. 22 French gauge sound, incise under cocain with a blunt-pointed bistoury.

3. If blood or pus is sufficient in quantity to render the urine non-transparent, this may be removed by washing out the bladder with distilled water, or better, a boracic solution, and refilling with distilled water.

† Willy Meyer, M. D. Genitourinary Diseases, Vol. I

4. In contracted bladders, or in those in which the capacity has been diminished by pressure from without.

5. With spasmodic contraction of the bladder, more especially in tuberculosis and other ulcerations. A 2-per-cent cocain solution usually overcomes this.

6. In certain deformities, such as ankylosed hip, a rickety pelvis or a kyphotic spine. A little adjustment of the head is needed in these cases to obtain a good view.

Passing very sparsely over the general assistance often given by the use of this instrument in the diagnosis of cystic lesions, we find another important field for the modern cystoscope, that of catheterizing the ureters. For some time we were content to catheterize the female ureters and that not without attendant and obvious difficulties. These have been largely removed by the modern cystoscope, and a still greater improvement has been made in the instrument of today by which we are able to catheterize the male as well as the female ureters. Dr. Brenner, of Vienna, was the first to make a cystoscope for catheterizing the female ureters, which answered the purpose nicely for the time being, but we are indebted to Dr. Nitze, of Berlin, for devising an instrument by which we are able to catheterize the ureter of the male as well as the female. At about the same time, Dr. Casper produced the instrument which I shall have the pleasure of showing you this evening. Neither time nor space will permit me to enter into any detailed discussion as to the merits of the various cystoscopes which have been devised, other than to say that after some experience in the use of the different methods I prefer to use the instrument made by Casper, of Berlin. It is simple in its construction and may be easily rendered aseptic; the curve of the catheter may be regulated at the operator's will to correspond to the line of the ureter; and a desirable feature of this instrument is its size, which is such as will permit of its use without an anesthetic either general or local.

After Dr. Howard Kelly's able address to this society some two years ago, and his excellent method and demonstration of catheterizing the female ureters, I need not remind you of the significance and importance of catheterizing the ureters in the male, as well as in the female, especially in some of the obscure kidney and ureteral lesions. As the symptoms are sometimes so varied and the clinical features so misleading, it becomes necessary for the clinician to exhaust every resource at hand in arriving at a diagnosis.

The following cases, some of which I had the pleasure of observing while abroad, will serve to illustrate to some extent and suggest the use of the modern cystoscope, as well as the beneficial results which may be obtained by this, I may say, comparatively simple method of catheterization.

In extreme atrophy or congenital absence of the kidney, always obscure conditions, nothing definite may be obtained from a physical examination, as by palpation, percussion, etc., to make clear the true nature of the condition, yet certain symptoms strongly suspicious of stone may exist in the side where the kidney is absent and lead us to contemplate operative measures. I saw an extremely interesting example of the latter at St. Peter's Hospital for stone, London, under the care of Mr. Frayer, to whom I am indebted for a history of the case. J. L. S., aged 62, a bus driver, had stricture for thirteen years which had been cut several times during this period. For years the patient had suffered from pain in the left renal region, associated with hematuria. This pain is severe and subject to severe exacerbations, when the patient describes it as shooting and throbbing, and on these occasions it radiates to the left groin and testicle. No actual sickness occurred during these attacks, but sometimes they were associated with nausea. Usually they last about an hour and a half and occur at varied intervals, frequently twice in twenty-four

hours. Increased frequency of micturition (two or three times an hour) accompanies the attack. For the last two years blood has been seen in the urine, varying in quantity, usually enough to color the urine uniformly, but on one or two occasions it has been in large quantities (the patient speaks of half-pints of pure blood). The urine has been frequently thick and foul, and the patient is in the habit of passing bougie and catheter morning and evening to keep his stricture dilated.

Pain.—During and after micturition in the urethra towards the root of the penis.

Stream.—Sometimes fair, usually sprinkling.

Freqency of micturition.—Day, six or seven; night, four or five.

Urine.—Alkaline, specific gravity 1.009; albumin, mucus and crystals of triple phosphates.

No cystoscopic examination was made.

From the above symptoms and clinical history, Mr. Frayer advised operation and proceeded to perform nephrolithotomy, when, much to his surprise, he found an entire absence of the left kidney. An extraordinary feature of the subsequent history of the case is that all nephritic pain subsided immediately after the operation and the patient had no return of renal symptoms during the four months which had elapsed.

Case II.—I take some pleasure in reporting this rather extraordinary case occurring in Prof. Landau's clinic, Berlin, under the care of A. J. Mainzer: L. H., a married woman, aged 28, had several miscarriages and complained for several years of pain in the right lumbar region, which radiated to the back and down the thigh. The pain was of a nephritic character with exacerbations of severe lancinating paroxysms, usually accompanied with nausea, which occurred three or four times in twentyfour hours. She had passed blood at different times. The patient said a diagnosis of stone in the right kidney had been made by two emi-

nent physicians who had advised operative measures. Upon investigation a history of syphilis was found, and the patient had been treated by her family physician for the same. While making a vaginal examination, the ovaries and tubes were found to be normal and the uterus was slightly enlarged but freely movable. Nothing could be elicited by palpation nor percussion, but upon deep pressure acute pain was produced. A cystoscopic examination was made and the bladder was found to be in a healthy condition. On catheterizing the left ureter, nothing abnormal was discovered, but in the other an obstruction some distance from the bladder was found, and by careful manipulation the point of the catheter was made to pass the obstruction. Then the urine began to dribble away, and after the removal of a quantity of urine, the patient expressed herself as having immediate relief. It was clearly evident that an obstruction of the ureter existed and it was thought to be a stricture and in all probability of specific origin. Subsequently the patient was treated by regularly catheterizing the offending ureter and the administration of antisyphilitic remedies, after which all nephritic symptoms completely disappeared.

It might be inferred that symptoms, being of specific origin, would naturally disappear under proper antisyphilitic treatment, but the method employed for immediate relief would seem to justify the use of the urethral catheter.

Case III.—I am indebted to Dr. W. B. Perry, of Baltimore, for a history of this case, which occurred in Chroback's clinic, Vienna: F. C., aged 30, a married woman with three children, for years had complained of pain in the left lumbar region, radiating to the back and thigh, which was intensified during the monthly periods, and had suffered greatly during pregnancy with frequent micturition, tenesmus and burning of urine. She had been treated for catarrh of the bladder three different times. At the time she was seen all her urinary symptoms were increased and

accompanied by a host of nervous and gastric symptoms. On vaginal examination, under an anesthetic, her genital organs were found to be normal. A cystoscopic examination was made and the lining membrane of the bladder looked quite normal, except at the trigone, which was slightly inflamed. The openings of the ureters were normal, but the urine could only be seen flowing from one. The ureters were catheterized and catheters allowed to remain *in situ* for six hours, during which time the patient was given plenty of water to drink. At the expiration of this period the urine collected from the left kidney was found to be less than one-fourth as much as that collected from the right.

An examination of the urine from the left kidney showed an acid reaction, specific gravity of 1.028. A few epithelial cells and crystals of triple phosphates, were found, but otherwise the urinary constituents were about normal. As regards the urine from the right kidney, aside from the increased quantity nothing abnormal was found.

An exploratory incision was advised and the patient prepared for operation. The lumbar incision was made and a very small kidney was discovered and removed, which measured 1½ inches long by 1 inch in width. The patient made an uneventful recovery without any of the previous nephritic symptoms. A diagnosis had been previously made of atrophy of the kidney, which was verified at the operation.

From a review of what has been said we may learn, by means of the modern cyctoscope, the following:

1. The condition of the vesical mucous membrane; the source and frequently the cause of hematuria.

2. The condition of the ureteral lips and whether urine is being conveyed from both kidneys to the bladder or not. If not, we may learn which of the two is the secreting kidney, and observe the character of the jets of urine propelled from the urethral cones, whether it be clear, murky or bloody.

3. To collect the urine from each kidney separately, for further examination.

4. To satisfy ourselves as to an existing constriction or obstruction of the ureter which would aid in guiding us as to what course we should pursue.

To decide whether one or both kidneys be affected and to what extent each may be involved, is a question that always confronts the surgeon who contemplates operative measures. Providing no obstruction of the ureter exist whereby the catheter cannot be made to pass beyond, I know of no greater aid to, nor better method of determining the character of the excretion, nor for estimating the quality and quantity of the excreting tissue that each individual living kidney possesses, than by using the modern cystoscope with the ureteral catheter adjustment. Since cystoscopy of today is no longer an experiment, the surgeon who contemplates operative measures in any doubtful case of vesical or nephritic origin, before deciding what course he should pursue, would do well to exhaust the light that the modern cystoscope may throw upon the apparently dark field, often of obscurity, uncertainty and anxiety.

IS THE USE OF THE RECTAL SOUND SCIENTIFIC?

BY THOS. CHAS. MARTIN, M. D., CLEVELAND

Lecturer on Diseases of the Rectum in the Cleveland College of Physicians and Surgeons

It is reported that Syme said:* "There is good reason to suspect the honesty of a man who pretends to enter a stricture which is beyond the reach of the finger."

There could scarcely be a more epigrammatic confession of helplessness nor one seemingly more devoid of hope than this. The great array of variously formed sounds which

* Ball, the Rectum and Anus, page 14. Lea Brothers & Co., Philadelphia

surgeons of unquestioned integrity have designed especially to locate and to enter strictures of this organ is further evidence that it is not unusual for medical men to entertain diverse opinions. Though Syme's terse pessimism may perhaps have summed the sound's possibilities as a diagnostic measure, the inquiring student reasonably fails to be convinced so long as there is no good reason given to support so pungent an affirmation.

That the employment of the sound within the movable rectum is not consistent with the mechanic principles upon which the practice of surgical sounding is based; that to enter a stricture by such means is possible but often impracticable; that the attempt is fraught with danger, and as a diagnostic instrument that the sound as commonly used is never reliable, this brief essay assumes to prove.

Sounding as a method of diagnosis requires three conditions: (1) that the tube to be sounded must have a recognized limited degree of distensibility; (2) that its mobility in the direction of its axis must be inappreciable, and (3) that there do not exist at irregular intervals normal anatomic obstructions in its channel sufficient to arrest the progress of a sound.

These conditions obtain in the urethra which is fixed from extremity to extremity within a mass of tissue which firmly supports it when the organ is in a situation for the practice of the maneuver. The rectum, on the contrary, answers negatively to each of these three propositions. Seven or eight inches, (17.78 or 20.32 cm.) of the rectum's length are not fixed; the lowermost inch (2.54 cm), is the only portion muscle-bound and as this part is easily accessible to digital exploration, to it, therefore, the method of diagnosis by sounding is not applied. A little way beyond the upper border of the prostate, or pelvic floor in the female, the rectum is invested by a loop of peritoneum which does not yoke the gut fixedly but anchors it loosely in the abdominal cavity.

(1) The distensibility of the abdominal rectum is governed by the elasticity or the resistance of the gut's inherent coats and is not limited by a comparatively unyielding musculo-fibrous wall supplied by the contiguity of other parts twenty-fold its own strength and several times its own density and bulk, as is the case with the male urethra. The normal range of distensibility of the rectum then may be said to be from zero to three and a half inches (0 to 8.89 cm.), and consequently a definite calibration for sounding is impossible. The sound of a size which may enter the anus is not to be considered elected for sounding the rectum (in accordance with the principles governing urethral catheterization which may be formulated in the aphorism: that sound which fits the mouth should discover contractions in the tube) as shall be seen. The average diameter of rectal sounds is about one inch (2.54 cm.). Two-thirds or three-fourths of the rectum's expansibility, which may be more than three inches (7.62 cm.), must then of necessity be sacrificed before rectal sounding will produce any definite evidence of stricture, providing all other things are equal and comparable to conditions obtaining in urethral catheterization.

(2) Let us suppose, now, that there exists such a considerable constriction of this gut. In such a case the element of mobility of a part of the rectum in the direction of its axis enters into the problem. The range of such movement of that part of the gut constricted is determined by the length of its peritoneal attachments at that point and by the elasticity of the mesentery and of neighboring portions of the gut, possibly by adhesions of the rectum to other organs, and also depends upon whether the contraction be on the side next the mesentery or opposite it, and is also influenced by the elasticity of the longitudinal muscular fibers of the rectum. To discuss these special points in detail would be to dwell upon the degrees of a fallacy. The perplexing fact is this, and is one that in itself should dethrone

the practice of sounding the rectum for the diagnosis of stricture: A bulb-tipped sound entering the rectum and coming in contact with a contraction presenting an aperture of lesser diameter than the bulb, will carry that part of the gut above its normal situation to a point where the limits of length and elasticity of the gut's attachments arrest the movement, at which time the sound will be stopped or else will enter, dilate and pass the stricture, or perhaps puncture the gut.

When the sound encounters an obstruction it is, of course, conventional practice to observe how far the *proximal border* of the supposed stricture is from the anus, which, let us say for purposes of illustration is exactly five inches (12.70 cm.). This measurement having been determined, it is now desired that a knowledge of the exact location of the stricture's *distal border* be obtained that the length of the gut affected by the contraction may be estimated. Having passed beyond the stricture the sound is gently withdrawn, the shoulder of the bulb presently engaging the upper border of the constriction will carry it downwards until arrested by the gut's limit of displaceability. The exposed length of the shaft of the sound is now measured and it is discovered that the most distant border of the contraction instead of being more than *five inches* (12.70 cm.), is but *three inches* (7.62 cm.) from the anus, or, to make a paradox, it is discovered that *the farther border of the stricture is two inches,* (5.08 *cm.*) *nearer the anus than the nearer border was! Reductio ad absurdum!*

(3) There is, however, one other factor which when fully recognized will effectually discountenance the practice of sounding according to customary rules. The semilunar valves, which I have demonstrated to be typical anatomic valves* and possessed therefore, of a structure which qualifies them to offer both active and passive resistance,

*See papers by the writer in *Mathew's Quarterly Journal of Rectal and Gastro-Intestinal Diseases*, Louisville, July and October, 1896

and which span one-half, two-thirds, and sometimes three-fourths the circumference of the rectum, and which have a depth from free border to that attached to the wall of the gut varying from a quarter of an inch(0.63 cm.) to one inch (2.54 cm.), according to the degree of distension of the rectum. These valves afford in many instances an effectual obstacle to the passage of the bougie; they supply evidence which simulates that of stricture when the sound is used; and, a valve may constitute a very ready pocket to trip up and deflect the sound's point out of the channel of the gut, through its wall, and into the peritoneal cavity.

Analytic survey of the anatomy of this part and study of the mechanics of surgical sounding compel the conclusion that the enormous normal distensibility of the rectum, its great susceptibility to upward and downward displacement, and its normal valvular partitions are significant that the customary method of sounding the rectum for the diagnosis of stricture is unscientific, is unprofitable as a diagnostic measure, and is extremely hazardous to the life of the patient.

DISCUSSION

Dr. G. W. Crile, Cleveland. The paper is one of extreme interest and the careful way in which the Doctor has brought out the premises from which he has drawn his conclusions, leaves very little to be said, except that they certainly meet with my idea of a surgical procedure. It is interesting to have studies presented in this forcible way.

I would like to ask a question, and that is, does the Doctor know or has he looked up the matter as to the number of times in which rectal sounds have been passed through the coat of the bowel? I would like to ask another question: Is there any possible condition in which the rectal sound might be used with safety and perhaps with some good results?

There is nothing at all in the paper that I see to discuss. I have received a great deal of valuable information from it and the questions I now ask are perhaps hardly pertinent.

Dr. A. Freiberg, Cincinnati: Like the previous speaker, I feel that the essayist has beautifully proved his points, yet there are just two of them to which I beg to call his attention. One is that, so far as I know, the danger to life from the use of the sound has yet to be demonstrated. I am aware there are cases where the sound has perforated the wall and patients have lost their lives, but unless we have definite information on this subject, I would be loath to accept it as a dangerous procedure. It has not occurred with any degree of frequency. Then in regard to the comparison with the use of the sound in the urethra. In the case of the rectum we are dealing with a tube, the opening of which is largely distensible. We have had an opportunity of demonstrating this to ourselves. This is not the case with the urethra. The urethra is a tube whose opening is its narrowest portion. The opening is not distensible without discomfort to the patient, and even if it is slit up we find that an instrument the full size of the urethra cannot be passed through the opening. The opening of the urethra is not usually as high as thirty, and the average runs twenty-seven to twenty-eight, French scale, while the usual caliber of the pendulous portion is at least 40. I think we can more nearly approach dilatation of the rectum through the anus than we can the urethra through its opening unless we use a sound that opens after it gets into the urethra.

Dr. Martin, closing: I feel that I have failed to make myself perfectly understood by one of the speakers. I meant to make a great contrast between the rectum and urethra and their eligibility to surgical sounding. With reference to the query as to the number of fatal accidents attending on the use of the sound, I would say that I have not gathered the statistics upon the subject. There is, however, scarcely a standard work upon the diseases of the rectum that does not contain reports of numerous instances of fatal issue on the use, or rather the misuse of the rectal sound.

In my criticisms I referred to the customary use of the rectal sound. I am convinced that the rectal sound may be used advantageously in certain instances not as a diagnostic, but as a curative measure. The patient must be placed in the knee-chest position to render its employment safe.

There are many conditions that forbid rectal sounding as conventionally practiced.

CHAPTER XI

FORENSIC MEDICINE

SOME MEDICAL ASPECTS OF CAPITAL PUNISHMENT

BY F. O. MARSH, M. D., CINCINNATI

Mr. President, Gentlemen: I hold in my hand two newspaper clippings in reference to an event since which some months have elapsed, but which is still sufficiently fresh in the mind of the public to have lost none of its pertinence.

FRANTZ' DEATH.

May Have Effect on First Degree Murder Trials.

Prosecutor Schwartz apprehends difficulty in securing juries for first-degree murder cases because of the Frantz electrocution. The circumstances of that tragedy of the law will, in the opinion of Schwartz, operate to change the mind of many regarding the penalty for capital offense.

LEAGUE.

Formed by Theosophical Followers.

An International Brotherhood League has been organized in the Theosophical Society. Its principal objects are to organize the charity work of the society, to elevate the workingman and to work for the abolishment of capital punishment.

The Cincinnati committee which has just been appointed for this league is: J. A. Knapp, Samuel Pearce, Mrs. Viola O. F. Scott, A. B. Leonard and Dr. W. A. R. Tenney.

Dr. Tenney characterizes the Frantz electrocution and all other executions as legalized murder, etc., etc.

The writer of the present paper is not a theosophic follower himself and claims no force of argument from the

efforts or intentions of these well-meaning people. Yet the above extracts illustrate the fact that the published reports of the Frantz electrocution in the Ohio penitentiary at that time did, and very properly should, excite some discussion concerning the merits of this method of executing criminals for capital offense.

Concerning the legal and moral right of a community through its officers to remove by death from its midst members convicted of certain high crimes the present paper has nothing to do. Granting, however, that the state *has* the right to inflict the death-penalty for the crime of murder in the first degree and presupposing that this view will continue to be the public consent upon the matter for an indefinite period, it at once becomes the duty of the state to provide that this so-called extreme penalty of the law shall be an equal penalty in each case in so far as lies within the power of the executioners.

There is no sentimental feeling to be charged to this view of the case, which involves the plainest dictates of simple justice. Justice should be meted out equally to all condemned to execution unless the law proceed to make subdivisions or subdegrees of the crime of first degree murder itself.

Without any learning in the law, the writer has deemed it safe to hazard the above statements merely upon the grounds of logic and common sense.

The substitution of the electric chair for hanging shows a disposition on the part of civilized sentiment to render executions if possible less brutal and revolting. Yet the halting inconsistency of this public sentiment which still demands that death shall be inflicted by some violent or mechanical means and at the same time hopes to render death painless and instantaneous by allowing a seven-foot drop, or lubricating the rope, or by the substitution of the electric chair, leads to frequent mishaps. In some cases the execution goes off smoothly, in others again there is a hitch or

an accident which defeats the principle of justice that the penalty in each case shall be an equal one.

As an example of this in a recent double execution in an adjoining state where both prisoners were declared equally guilty of a joint offense and both were executed at the same instant upon the same gallows, one was supposed to have died instantly and painlessly of a broken neck, while the other was supposed to have suffered all the horrors of strangulation. This is purely supposition as after being cut down the prisoners refused to be interviewed and their own personal reminiscences of the performance could not be obtained for publication. Still the supposition may well have been correct.

It has been a moot question even whether death by decapitation might not be attended by a few horrible seconds of consciousness on the part of the severed head.

In the Frantz execution every preparation had been made for rendering death instantaneous and painless, yet it is possible that all these efforts were baffled by the electric contact being made through a thick mop of hair, the electric resistance of which is equal to vulcanite and even when moistened with an acid or saline solution is still a very imperfect and uncertain conductor.

In this case, judging from the testimony of experts, concerning the character and enormous power of the current used, the prisoner was in all probability rendered unconscious at the instant of the first contact and subsequent convulsions were likely of a purely unconscious or mechanical nature. But still there has been room for considerable doubt and disagreeable reflection on the part of witnesses and the officers in charge.

A published opinion of a minister of the gospel indicating a preference for the ancient custom of poisoning criminals illustrates the absolute need of medical opinion upon the subject. If the writer had his choice he certainly would not prefer to have his alimentary canal scalded with cor-

rosive or irritant poisons such as carbolic acid or arsenic, or to have his spine racked for hours with strychnin, or to suffer the shock and convulsions from prussic acid.

The only poisonous drug of any prominence or importance which is known to be absolutely free from pain in its action, morphin, is slow in its action, apt to be vomited when taken by the stomach, and might prove a failure even when given in a supposed fatal dose.

There is one method of inflicting death which strongly suggests itself to the medical mind in this connection, and that is by means of *chloroform*. If it is the object of civilized sentiment simply to inflict the death-penalty for murder without any desire to inflict an uncertain, variable or unjust amount of pain in addition, we have certainly here a means of removing criminals which is at once simple, speedy, certain, and so far as we are capable of knowing anything is known to be absolutely painless in all cases.

To accomplish the desired end it is only necessary to induce chloroform anesthesia in the ordinary way and carry it to the point of permanently stopping respiration and the heart's action.

Not the least of the many recommendations of this method is the fact that besides being extremely simple and devoid of all complicated and cumbersome paraphernalia which are apt to be bungled and to get out of order, it is most inexpensive. It would only be necessary, having strapped the prisoner to his cot, to put on the usual black cap or death-mask and over this an ordinary chloroform inhaler fastened with buttons or tapes over the nose and mouth. The inhaler should then be kept saturated with chloroform until the desired end is attained.

It is hardly necessary to suggest that as in executions as at present conducted a physician should always be in attendance. For the benefit of the laity who may perchance ever be called upon to consider the practicability of these suggestions it may be well to state that death by this means

is essentially painless as we are here employing the very means in daily use to obliterate pain during surgical operations. Any struggling or resistance during the early stages of chloroform administration comes through fright or apprehension but not from physical pain.

The question as to how long it would take to complete an execution by this means cannot be accurately answered. Complete insensibility may be induced in from five to ten minutes. The process might then be facilitated by covering the inhaler with sheet-rubber to exclude atmospheric air. Perhaps death would supervene in a half-hour.

The writer believes that the substitution of the method above indicated would in no wise abate the majesty and the terror of the law, and that executions by this method would have a deterring influence equal to that by the present method. It would relieve attendants and officers in charge of an amount of anxiety otherwise unavoidable. In thus simply remanding a murderer before his Maker the state would lay the onus of vengeance and retribution upon the only shoulders in the universe broad enough to bear it.

DISCUSSION

Dr. D. N. Kinsman, Columbus: I do not know that I have anything to say, but the subject is worthy the attention of everybody. It is going to force itself on our notice and is already doing so. I understand there will be no further execution with our electric apparatus in the State of Ohio. I doubt if we have reached the best way even with chloroform. I have thought the better way would be to plunge a man into a bath of carbon dioxid gas, or better drown him in the nearest pond. I am quite sure it would be cheaper, if that phase of the subject is to be considered. We would need no attendants and there would be no failure. That would be the end of it.

Dr. Marsh, closing: I believe I have hardly anything to add except perhaps one other advantage that executions of this sort would have. They would probably do away

with the dramatic spectacular interest pertaining to such occasions. Hanging, probably, has a certain fascination for the criminal class as it is about on a par with its mentality. It would be just as expeditious to drown the patient as to use an atmosphere of carbon dioxid gas, although there would be more suffering than in death by chloroform. We know better what we are doing, thanks to those who have gone down to the very verge of eternity under chloroform anesthesia and testified they felt no pain. Probably the principal objection among the laity would be that the wilful murderer has no business to be wafted into eternity on a bed of roses. That is an objection which is more than counterbalanced by the manifold advantages which executions by chloroform would present.

CHAPTER XII

PHYSIOLOGIC CHEMISTRY

ON THE PRODUCTION OF A CARBOHYDRATE FROM EGG-ALBUMIN

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The statement has been made by Pavy[1] that egg-albumin, boiled first with potassium-hydroxid solution and then with dilute sulphuric acid, furnishes a carbohydrate similar to the *animal gum* of Landwehr.[2] Schutzenberger[3] also obtained a strongly reducing substance, which he supposed to be "glucose or resembling glucose" when he heated egg-albumin with dilute sulphuric acid or barium hydroxid solution. The results in either case if true would be of great interest, not only from a chemical standpoint of the decomposition-products of albumin, but probably also in reference to its fate in the animal organism and in the metabolism of the body. It would therefore seem of the greatest importance that a purified egg-albumin be used in the experiments. To this end, the whites of 100 hens' eggs were freed from cell-membrane, globulin, sugar and ovamucoid in the following manner:

The whites were well beaten, allowed to stand over night and strained. The clear filtrate was mixed with twenty volumes of water and acetic acid cautiously added until no further precipitation occurred. After standing ten or twelve hours, or until the globulin had completely settled, the liquid was strained through a linen filter. The filtrate was now heated to boiling, the coagulated albumin drained on linen and washed. The filtrate and wash-water contained the sugar and ovamucoid. The albumin was removed from the strainer, dissolved in weak potassium

hydroxid mixed with water and precipitated with an excess of acetic acid and strained and washed with hot water. The albumin was purified by solution in weak potassium hydroxid and precipitated with acetic acid three times in order to remove every trace of sugar and the mucin-like substance. Finally the still moist flocculent albumin was placed on sheets of glass, protected from dust, dried in the air and granulated in a mortar. Prepared in this manner it has a light amber hue. Throughout the operations filter-paper was discarded in order to prevent the introduction of cellulose fibers, which in the subsequent boiling with mineral acid would produce dextrose. Negative results having been obtained with quantities of five grams of the dried albumin, several portions of 25 grams each were dissolved in weak potassium hydroxid by occasional agitation during 10 or 12 hours; sufficient potassium hydroxid was now added to make a 10 percent solution. The whole was heated on a water-bath for 30 minutes in a flask connected with a return condenser. The contents of the flask was allowed to cool, almost neutralized with acetic acid, evaporated to 100 cc., then poured in a small stream into 12 liters of 95 percent alcohol and allowed to remain for three days. The alcohol was then poured off from the granular, amber-colored deposit and the latter dried. The precipitate was dissolved in water and sufficient sulphuric acid added to make a 10 percent solution, which was now heated on the water-bath for one and one-half hours in a flask with a return condenser. The contents of the flask, mixed with hot water, were completely precipitated with barium-hydroxid solution, filtered and evaporated into a small bulk, when they were tested with Fehling's alkaline copper-solution, and Nylander's alkaline bismuth-solution for a reducing-substance, and with phenylhydrazin for the production of an *osazone*, always, however, with negative results. If ordinary egg-albumin be subjected to the Pavy procedure just mentioned, boiling with potassium hydroxid and the alcohol

precipitate with dilute sulphuric acid, etc., a decided reduction takes place in the copper and bismuth solutions and an osazone is formed from phenylhydrazin. Analogous negative results were obtained when Schutzenberger's experiments were repeated with the purified albumin. In this case, however, the albumin was removed from the final solution to be tested by means of phosphotungstic acid. From the results obtained we are inclined to attribute the reduction in the copper and bismuth-solutions and the formation of an osazone to the sugar already present in the white of the hen's egg or to a carbohydrate produced from the *ovamucoid*[4] (propeptone[5]) or an associate of it.

The production of cupric oxid reducing-substances after boiling with mineral acids is not alone characteristic of ovamucoid, but of metalbumin, paralbumin and different kinds of mucin, together with chondrin and cerebrin, as the researches of Eichwald, Obolenski,[6] Hoppe-Seyler,[7] Scherer,[8] Hammarsten,[9] Landwehr,[10] and the remarks of Drechsel,[11] show.

As a conclusion to his work, Pavy considers proteids to be glucosids. I am, however, inclined to believe that not all proteids, even in the impure state, contain a carbohydrate molecule. This opinion is corroborated by N. Krawkow;[12] nevertheless, we hope to give this subject further study in the near future.

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[5] R. Neumeister: "*Zur Physiologie der Eiweissresorption und sur Lehre von den Peptonen.*" *Zeitschr. f. Biologie* N. F., 9, 369.

[6] *Archiv. f. d. gesammte Physiologie* 4, 236.

[7] *Handb. d. physiolog. u. patholog. chem. Analyse* 4te Aufl.

[8] *Annalen d. Chemie v. Pharmacie* 82, 135.

[9] *Zeitschr. f. physiolog. Chemie* 6, 194.

[10] *Loc. cit.*

[11] E. Drechsel: "*Ueber die Reduktion alkalischer Kupferloesungen durch Eiweisskoerper.*" *Zeitschr. f. Physiolog. Chemie* 21, 68.

[1] N. Krawkow: *Chemiker Zeitung*, 1897, Rep. 78.

ON THE ACTION OF NEUTRAL ALKALINE SALTS AND WATER

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[The author claims no originality for the views here presented; his only desire is to foster by a faithful translation these, Schmiedeberg's ideas, which he has so ably presented in his classical treatise "*Grundriss der Arzneimittellehre*," Leipzig, 1895, 3te Aufl.]

COMPARISON OF THE ACTION OF INORGANIC AND ORGANIC NERVE, MUSCLE, METABOLIC AND CORROSIVE POISONS

In the organic nerve, muscle, and corrosive poisons it is the unaltered molecule of a substance, for example, strychnin, which, in a peculiar or specific manner, becomes active. In the inorganic, on the contrary, the alterations occasioned by the strong acids, the halogens, the basic oxids and their salts in the organism, are due, either to the general physical properties of the molecule and the atoms in solution produced by dissociation, or to a specific action of the dissociation-products, or finally, to ordinary chemic reactions between tissue and active substance.

To the physical or collective properties of the soluble or dissolved molecule and the dissociation-products resulting after solution, be these atoms or groups of atoms, the processes taking place in diffusion and osmosis, abstraction of water by soluble substances, the lowering of the freezing-point and the raising of the boiling-point of solutions, are due.

All parts separated by solution and dissociation are in their relationship equal. A like number of the parts in the same unit of volume of solution of very different substances occasions the same osmotic movement, lowering the freezing-point and raising the boiling-point in the same degree. To this conduct of soluble substances their general action on the organism is due. Although all soluble sub-

stances, organic or inorganic, dissociable or non-dissociable, may possess these atomic, molecular, physical properties in general, the number which in a pharmacologic sense play an important part in this manner is very limited. With the exception of urea, almost all organic substances are excluded, because they are poisonous even in small amounts, so that their general properties do not come into consideration, or because they, like sugars, after their absorption, are burned up and cease to exist, or finally, like gum arabic, have a colloid consistency and a high molecular weight and therefore possess the properties under discussion only to a limited degree. Of the inorganic compounds also, only the neutral salts of the alkali metals, which have no strong independent action on the nerves, muscles, and other organs, come into evidence here.

This action, due to molecular-physical properties, can be briefly called *salt action*, and varies with relative absorbability. The physiologic and pharmacologic importance of dissociation-processes in the organism is based, not only on the fact that the number of physically active parts is increased, but that it is much more extensive.

Dissociation renders possible many chemic processes, namely: the double decomposition of the salts through an exchange of their constituents and the separation of the dissociation-products, for example chlorin from chlorids in the form of hydrochloric acid in the gastric juice. Pharmacologically the independent action of the dissociation-products becomes particularly prominent, and with heavier metals, is the essential part of the real poisoning. The characteristic actions of inorganic compounds dissociable in solution, on the nerves and muscles are brought about by the dissociated *ions*. The proof of this view lies in the fact that the compounds of the metals only show their characteristic action when they can be dissociated. With the metalloorganic compounds this is not the case, and therefore the characteristic metallic action is absent.

All salts of arsenic act alike except its methyl compounds, kakodyl oxid and kakodylic acid; these, on the contrary, act in an entirely different manner.

In the case of potassium iodid, aside from the salt action, there comes into consideration the specific action of the iodin as well as the potassium ion.

The animal organism is always under the action of the ions of sodium chlorid. This action cannot be directly determined, however, because it constitutes the normal condition with which the action of the others salts is compared. A detection of a deviation from the normal condition is therefore alone desired. The presence of such a sodium chlorid action is proved by the fact that this combination cannot be replaced by other alkaline salts.

The chemic corrosion of the tissues by means of acids, halogens, basic hydroxids, the salts of the alkalis and heavy metals, is principally occasioned by the general chemic properties of the combinations. Only the neutral salts of the alkalis occasion a local corrosion by salt-action; they also, in a concentrated condition, abstract water from the tissues and usually also penetrate into the same, and in consequence alter their normal constitution and thereby occasion a reaction.

WATER AND NEUTRAL ALKALINE SALTS

The deportment of these salts in the organism, as has been previously stated, is determined by a general salt-action on the one hand and on the other by a decomposition and the specific poisonousness of the ions. On their introduction into the stomach and intestinal canal this deportment is very considerably influenced by the different conditions of the absorption of the several salts.

The chlorids, bromids, iodids, as well as the nitrates, chlorates, and iodates of the alkali metals pass very rapidly from the mucous membrane of the digestive tract into the fluids and tissues of the body, and can here, undisturbed,

develop all their actions with the physiologic salts of the organism, and arrive for excretion in a relatively short time in unaltered condition, or partly in the form of reaction-products.

The absorption of the alkaline earths, on the contrary, takes place only very slowly and in small quantities.

The actions are principally confined to the intestinal canal in that they, through their molecular-physical properties, produce diarrhea and consequently constitute a special group of the cathartic salts.

In osmosis they always go with less rapidity through a closed membrane than the easily absorbable salts, and are inclined, as a rule, according to the researches of Hofmeister, 1888, to more easily precipitate colloid substances from their solutions.

WATER AND EASILY ABSORBABLE NEUTRAL SALT GROUP

If solutions of different molecular concentration are separated from each other by membranes or similar partitions, which they stimulate by high pressure without, in turn, allowing filtration, then a movement through the membrane from the concentrated to the more dilute and *vice versa* takes place, the water passing from the dilute to the concentrated solution. The movement takes place to equalize concentration, which lasts until, in a unit of volume, each of the original solutions contains the same number of separate molecules or dissociated ions of the dissolved substances. This condition of equality is known as the *isotony* of solutions. If the membrane will only allow the passage of water and not the dissolved substances, then water passes through the membrane from the dilute to the concentrated, until isotony is obtained. Thereby the volume is increased, and when it cannot escape in the neighborhood, but is compelled to remain, it produces a hydrostatic pressure (dependent on concentration), which is called the osmotic pressure. Two solutions separated by

an osmotic membrane are therefore *isotonic*, when they occasion the same osmotic pressure.

Solutions which are not isotonic can be called *anisotonic;* the more dilute the *hypoisotonic*, the more concentrated the *hyperisotonic* solution.

These osmotic processes and physical-tonic conditions play an important part in the organism, only here they are more extensive and complicated than has been described in the foregoing scheme, and therefore are difficult to observe and follow. Whereas the membranes and coverings of the living cellular elementary organs in osmosis are seemingly completely penetrated by water and readily by dissolved substances, others only pass with difficulty, and possibly not at all. To such a selection in the assimilation of substances on the part of the cellular organic elements a part of the processes can be referred; these, like glandular activity, are often supposed to be specifically vital. These conditions become the more complicated if we take into consideration that physical isotony need not of necessity be physiologic at the same time.

The first exists and the solutions are isotonic only when they contain the same number of dissolved molecules or dissociated ions, without being of the same substance in the different solutions. If in such solutions very different salts and other neutral substances be brought into plant-cells, they remain entirely unaltered externally, whereas from hypoisotonic solutions water passes into cells and the cell-membrane is removed from the protoplasm, a process which de Vries, 1884, has called *plasmolysis*. But in isotonic solutions the physical properties of the cells, (their expansibility), alone remains unaltered when the dissolved substances are unlike those of the cell-contents. In this case, according to the penetrability of the membrane, an exchange of the substances between the external solution and the cell-contents takes place, whereby the latter is altered in its composition and the vital condition of the cell is influenced.

The deviation from the normal, which the absolute or relative quantity of the dissolved substance in the elementary organs is subjected to under the influence of physiologic salt-solution, can hardly be considerable. Still, it is sufficient to cause death of tissue; also lesser deviations will occasion a marked alteration in the deportment of the function of the organ and in the metabolism, which can be easily brought about artificially by increased influx of water or salts, and thus in many cases can be used with advantage therapeutically.

WATER ACTION

The local action of pure water is principally one of the osmotic extraction and swelling of the tissues. If living organ-elements or lower organisms are brought into pure water free from salt, they quickly die, because salts and other soluble substances are removed in such enormous quantities that a continuance of life is endangered or arrested. In fact, fish die rapidly in oxygenated distilled water. (S. Ringer, 1883.)

Slight alterations in the concentration and composition of salt-solutions which permeate the tissues, give rise to functional and nutritive disturbances in the same.

Milder grades of this water-action come into practical consideration in water-cures, where pure thermal or other waters are ingested in large quantities for a long time.

By flushing out the stomach the superficial layers of epithelium are greatly swollen and extracted; thereby they are rendered incapable of life, and are exfoliated, a process which leads to a marked regeneration, whereby pathologically altered tissue-elements are replaced by normal, and diseased conditions of the gastric mucous membrane are often benefited, if not cured.

In bathing, on the contrary, a pure water-action plays but little if any part, because the water cannot penetrate or in any great degree alter the external cuticle. In warm-

water baths the body not only does not take up the water, but through the escape of the latter through the skin the bodily fluids are decreased. L. Riess, 1887.

Only protracted baths cause a swelling of the superficial layers of the skin. These alterations take place more readily on diseased skin or when the external layers are removed from the epidermis in wounds or tumors. In such cases the influence of local baths is analogous to the effects on the stomach. An easier exfoliation of the altered tissue-elements follows and the injured part remains protected from contamination through carriers of infection.

In regard to the absorption of water in the digestive canal which occurs very rapidly, the stomach seems to play little or no part. In fact here water serves as a hindrance to the absorption of other substances, such as sugar and peptone, since these are absorbed in relatively smaller quantities from dilute solutions than they are from concentrated, whereas in the bowel a less concentrated condition favors this process. Tappeiner, 1881; v. Anrep, 1881; Segall, 1888; Brandl, 1893; Mering, 1893.

The reason for the absorption of water in the bowel is not yet sufficiently known. Osmosis and endosmosis or dialysis cannot play a part here; they would not, for example, explain the thickening of the feces. Filtration will also not explain the absorption of the water, because it is not to be supposed that, with the susceptibility of the tissue a difference in pressure exists which is essential to filtration between the intestine and organs or blood.

It seems as little possible that through open *stomata* an excretion of water takes place through the digestive tract. If this were the case all fluids would be absorbed with equal rapidity. This does not take place, however, since a solution of sodium sulfate conducts itself entirely differently from a solution of common salt. On the contrary, the absorption of water in the intestinal canal and other mucous membranes can be viewed as a *swelling process*.

The parts of organs capable of swelling, coming in contact with water, take it up and give it up again in the form of serous lymph, or it is abstracted by the blood flowing by.

There seems to be no positive ground for including any particular vital force in the transport of this water. The blood does not alter its concentration much with the absorption of large quantities of water. It is therefore probable that the abstracted water, as also fluids injected into the blood, collect in the tissues, (Hamburger, 1890,) and then gradually reenter the lymph, and blood-channels, and are excreted through the kidneys. The excretion of water through the kidneys is due to the blood-pressure in the vessels of the glomeruli, and consequently can best be referred to filtration, in which the filter must be so arranged that it takes up the water but not the dissolved substances, and conducts it further, whereas these others are taken up by the epithelium in other parts of the kidney and are given off in the urinary canals. In this manner can be explained how, in the diuresis brought about by the simultaneous intake of common salt and large quantities of water, the osmotic pressure of the excreted urine can sink below that of blood. (Dreser, 1892.)

Sweating can only take place after the ingestion of large quantities of water, with the skin at the same time in a state of congestion, which for practical purposes is brought about by preventing cooling, or by raising the temperature of the neighboring parts, thus warming the surface of the body, whereby the vessels of the skin are widened, and possibly also increasing the function of the sweat-producing nerves.

Such water as is necessary to keep up the normal distention of the tissue and to dissolve colloid constituents of the body has but little to do with excretion through the kidneys. On the contrary, by increased administration the excess is rapidly removed. Thereby the percentage of solids in the urine falls, so that the latter, by drinking large

quantities of water, can be greatly diluted. Pure water is easily excreted by the skin and lungs, and it is therefore advisable, in place of this, to select dilute salt-solutions if it is the purpose to render the urine less concentrated in reference to its general constituents, for example, uric acid.

The increased intake and excretion of water is associated with the appearance of large amounts of nitrogenous metabolic products in the urine.

In healthy persons, for example, after taking four liters of water in twenty-four hours the amount of urea in the urine is raised twenty percent, whereas the uric acid entirely disappears. In this same experiment the quantity of sulfuric acid increased proportionately with the urea, so that the former under normal conditions as well as after the use of the water gave the proportion of 10 grams of urea to 0.60-0.68 grams of sulfuric acid. (Genth, 1856.)

It deals therefore with increased formation of nitrogenous metabolic products in consequence of excessive destruction of proteids and not only with an extraction of the tissue and an accelerated excretion of the urea already formed. The latter is therefore increased in amount when in consequence of a diminution of other secretions the amount of urea is increased abnormally. (Kaupp, 1856.)

However, this influence of water on metabolism in researches on animals is not a constant one and is dependent on the condition of nutrition of the latter, as in starving animals the destruction of the proteids seems to occur more easily. Further, the increased excretion of urea seems to be a transient one; it ceases often after a short time in spite of the continued administration of large quantities of water to dogs. (J. Mayer, 1880; and in man, Oppenheim, 1880.)

The preceding facts show that even with the passage of large quantities of water through the organism the nitrogen balance is finally reestablished under these conditions; however, the tissue should contain a much smaller quantity of nitrogenous material than before the advent of the water.

If such an alteration is produced under normal conditions, then it can be supposed that, with a methodic use of pure water in the form of indifferent thermal and cold springs, pathologic products will be more readily affected and brought to absorption in case they are subject to destructive metamorphosis at all. In this manner the beneficial result of drink-cures on inflammatory and hypertrophic disturbances of nutrition of different kinds can be explained.

From the above it also follows that a beneficial result is not always to be expected. The special indications rest on an entirely empiric foundation and are therefore very uncertain. The supposition that in obese persons the storing up of fat is favored by the free use of water and diminished by its limited use, is not corroborated by experiment in fattening animals; in this case but little water is given with the fattening food.

THE SALT ACTION

Salt action in the purest form is brought about only by the use of sodium chlorid; but the other salts in a dissociated condition also influence more or less different parts of the nervous system.

Of the neutral salts which are readily absorbed, chlorid, bromid and iodid of potassium, and, in part also, the sodium compounds, have become of practical importance.

The salts and their concentrated solutions extract water from the tissue like any moist body by osmosis. Thus, if they belong to the sodium chlorid group, they rapidly penetrate the tissues in large quantities; the tissues then become poorer in water and richer in salts. Through both of these processes, to which usually a solution of cellular constituents and an independent action of the molecularly separated salts are added, a stimulation is occasioned at the point of application, which according to the character of the tissue is either a purely nutritive, or at the same time a functional one. In the mouth under ordinary conditions the latter,

in the form of a salty taste, only comes under consideration.

Salt-solutions are therefore local stimulants and as such often find practical application to the external skin as well as the mucous membrane of the stomach and intestinal canal. Salt springs, pools, mother-liquors and sea-water serve as skin stimulants in the form of baths in many conditions. Because the action is only superficial and never attains a high degree, due to the resistance of the skin, such baths may be taken for weeks and months without risk of injury to the skin, as is the case with the use of many other means, even with warm water. On this fact the use of salt baths is based. Their several constituents are consequently immaterial, and therefore any other action is not to be thought of, because salts are not absorbed from their solutions by the undenuded skin.

On the mucous membranes the salts of this group produce a much stronger stimulation than on the external skin, in fact they can in large doses occasion gastrointestinal troubles; this is particularly so with potassium nitrate.

The weaker grades of salt action can be of service in different diseased conditions of the stomach. A lowering of the functions of the stomach, as is the case after the use of large quantities of alcoholic drinks, is more quickly relieved by the employment of strongly salted foods than it is by a non-stimulating diet. Like other stimulants, common salt favors absorption in the stomach. In chronic stomach troubles the use of saline waters is often advisable. The peculiarity of salt action as compared with that of other stimulants is to be explained not only by the superficial flooding with salt-solution, but at the same time it penetrates deeply in a broad stream into the layers of the gastric mucous membrane and by a constant, but not excessive stimulation it favorably alters the nutritive conditions.

Concentrated salt-solutions occasion in man and animals a pouring out of fluid into the stomach.

The results of the passage of salt-solutions into the blood and the tissues after their introduction into the stomach have only been closely studied with common salt. First, a more or less intense thirst is noticed, occasioned by the giving off of water to the concentrated salt-solution, which in such a condition can no longer fill the purposes of the organism, even though it is found in the latter. Consequently thirst is noticed before the resulting diluted salt-solution has left the body. It acts at the same time as a foreign constituent and is therefore excreted by the kidneys. Consequently an increased intake of sodium chlorid occasions an increased excretion of water; it acts, in other words, as a diuretic. Probably a direct stimulation by some of the salts, such as sodium nitrate, on the kidney epithelium also comes into consideration. (Gruetzner, 1875.)

In dogs the urine becomes alkaline through the ingestion of large quantities of salt. (Flack, 1872; M. Gruber, 1887.)

In dropsies not due to circulatory disturbances, but to an alteration of the nutritive conditions of the tissues, the use of salts as diuretics is preferable. The mere increased excretion of water cannot be viewed as a beneficial result, because the loss is again covered by food and drink. Such dropsies, when not the result of kidney disease, are due to an increased swelling power of the tissue, and this is influenced in a favorable manner through salt action. Like pure water, the salts likewise, principally as a result of the increased excretion of water, occasion an elevated metabolism; at least the amount of urea formed and excreted after the introduction of sodium chlorid is increased in man (Kaupp, 1868; Rabuteau and Blanche, 1868), and dogs (Bischoff, 1853; Voit, 1860). The salt in this regard acts like water, both probably favoring the osmotic passage of the parenchymatous fluid through the tissues (Voit). This increased flow also takes place when, with the same intake of water, the sodium chlorid in the organism suffers in con-

sequence of the interruption of the usual introduction a sudden diminution. Thereby it becomes plain that the excretion of urea under these conditions is also increased. (Klein and Verson, 1867.)

After the absorption of alkali salts not only does the compound administered appear in the urine, but other salts in large quantities also. The administration of sodium salts occasions an increased excretion of potassa in the urine of man (Becker, 1854), and dogs (Buchheim and Reinson, 1864). Potassium chlorid, on the contrary, elevates the amount of soda, and ammonium chlorid increases the quantity of potassa as well as that of soda in the urine. In that the chlorin of this compound combines with these bases in the organism (Buchheim and Wilde, 1855), potassium bromid causes an increase of the chlorids in the urine (Bill, 1868).

Of particular interest is the simultaneous loss of sodium and chlorin with the absorption of large quantities of potassium salts. (Bunge, 1873.)

If alkaline salts containing neither chlorin nor sodium enter the blood a partial neutral exchange takes place between them and the sodium chlorid. Through the introduction of postassium phosfate or potassium carbonate in this manner potassium chlorid and sodium phosfate are formed in the first case, and potassium chlorid and sodium carbonate in the second.

The newly formed salts are superfluous for the organism and consequently pass with the remainder of the unaltered phosfate or carbonate into the urine, so that, under these conditions, considerable quantities of chlorin and sodium derived from common salt are removed from the organism (Bunge). Still, the increase of sodium excreted through continued administration of potassium salts is not permanent and is absent with a slight excess of sodium salts in the organism (Gaehtgens and Kurtz, 1874). Because of this extraction of sodium the desire may arise, in consum-

ing vegetable food rich in potassa, to use common salt at the same time, as is the case in herbivorous animals and with all races who live principally on a vegetable diet, whereas shepherds and fishermen have no desire for common salt, because in animal food the amount of potassium in relation to sodium is much less than in the vegetable. (Bunge).

With diminished common salt in the organism the excretion of chlorids through the urine is lowered or completely arrested, as for example in febrile diseases through insufficient consumption of food, or in consequence of the passage of large quantities of sodium chlorid in the exudates, in the perspiration and other excretions (Redtenbacher, 1850). Therefore such herbivorous animals can exist without any influence on their well-being which take no sodium chlorid with their food rich in potassa. Still, it is shown in domestic animals, that with the administration of sodium chlorid the condition of nourishment is much more favorable.

Since in consequence of such decomposition more salt comes into action and excretion than is administered, therefore it can be supposed that the influence of potassium salts on metabolism and the passage of water into the urine is greater than with an equivalent quantity of sodium chlorid. This condition makes it clear why the use of potassium compounds is preferred as diuretics, and why these, like potassium iodid, play such an important part in disturbed nutrition.

THE IONIC ACTION OF SALTS

Of the action which the *ions* of the salts occasion in an independent manner those are of particular importance which appear after the introduction of potassium compounds and the iodids, bromids and chlorates of all alkali metals.

POTASSIUM ACTION

In comparsion with sodium chlorid, potassium chlorid, after its absorption presents independent actions on the cen-

tral nervous system and muscles noticed in all soluble potassium compounds, in case they are not marked by any stronger effects referable to a particular constituent, for example, the oxalic acid of the oxalates.

If introduced into the stomach, an action independent of that due to absorption cannot be discovered, because small quantities of potassium salts are excreted as rapidly as they are absorbed, so that an accumulation in the blood does not take place. Larger doses readily occasion gastroenteritis through local salt action. Whether it is possible in man by the methodical use of potassium salts to reduce a diseased elevated reflex excitement and an increased general sensibility by the use of these salts could not be determined (Bunge, 1871). At all events the postassium compounds in foods and luxuries such as wine, meat extracts, and potatoes have no importance as irritating agents on the functions of the heart. As little value have they at the sick bed, where they are given to moderate fever by weakening the cardiac functions.

THE ACTION OF THE IODIDS

The question, which actions of sodium iodid, in comparison with sodium chlorid, are due to the iodin in the organism in ionic form, cannot be answered with certainty.

Free iodin seems, after the absorption of iodids, to appear only in certain parts of the organisms. According to the researches of Buchheim and Sartisson in 1866, it can be inferred that the catarrhs of the laryngeal and nasal mucous membrane, "iodin snuffles," as well as the cutaneous exanthemata, which are often observed after the use of potassium iodid are due to this.

On the surface of the skin the iodids suffer decomposition, possibly through the acid contents of the sebaceous and sweat glands, at first probably only with the formation of hydriodic acid, which then easily gives up iodin, which,

in turn, occassions the exanthem. This acid is very probably also found in the stomach after the administration of iodid of potassium. Buchheim and Strauch, to be sure, could not find it there, still this is due to the fact that hydriodic acid is easily decomposed, and the iodin thereby produced combines with albumin and in this form escapes direct detection. Recently, however, it has been possible to detect small quantities of hydriodic acid in the stomach contents after the administration of iodid of potassium. (Kuelz, 1887.)

Regarding the possibility of the liberation of iodin in the blood and tissues after the use of iodid of potassium there has been much discussion; still any positive proof for this does not exist as yet.

Of the iodids, iodid of potassium is by far most used in general proliferation of tissue as the result of syphilis, in exudative inflammations, rheumatic affections, swelling of glands as in goiter, and in similar conditions.

To estimate the action of these remedies it must above all be remembered that such pathologic conditions are not always relieved, and on the other hand, they may get better without any treatment. That iodid of potassium favors such an outcome in many cases may be accepted. These facts point to the conclusion that the beneficial results are occasioned, not by any special influence on a certain organ or part of an organ but by an alteration in the metabolism and nutritive processes of the body. The latter need not in a normal condition of the body make themselves known, at least through an increased or diminished excretion of urea during a short period. Its importance probably consists only in that the less stable pathologic products are introduced into the process of tissue-exchange.

Potassium iodid, like no other salt, occasions a complete series of actions. It is very rapidly absorbed, penetrates into all tissues and with sodium chlorid causes a double decomposition into sodium iodid and potassium

chlorid; consequently its salt action must be particularly strong.

If we further consider that besides the potassa and a particular iodid action which probably also extend to the conditions of metabolism, free iodin can have a direct influence on the tissue, we then have, under these circumstances, sufficient ground for the explanation of the action of this iodin compound. To be sure, it must at present remain undetermined whether the one or the other action is the beneficial means, or whether they are together influential. The latter does not seem to be improbable, because iodid of potassium in the treatment of the diseases named cannot be efficiently replaced by another iodid, nor by another potassium salt, nor by easily absorbable salts in general.

ACTION OF THE BROMIDS

Potassium bromid conducts itself in the organism in general like potasium chlorid, the salt and potassa action being the same. After the administration of large quantities bromhydric acid appears in the stomach. (Kulz, 1887.)

Potassium bromid is used in diseases of the nervous system in order to lower an increased excitability of the sensory and motor territories of the brain and thereby correct sleeplessness and prevent the advent of epileptiform seizures.

The quieting action affects tactile irritation and other irritations of senses due to reflex processes, and the functional area of the corpora quadrigemina, whereas those of the cerebral cortex are only influenced by large and long-continued doses. Consequently, the effects of this remedy, in epilepti-form seizures which originate in the cerebral cortex, are not so strong as in such as spring from deeper sections of the brain. According to the statements of numerous observers the value of the remedy is not to be disputed. On the contrary, the question has not yet been definitely

answered, whether it is due to a potassa or a bromid action, or to both.

In experiments with bromid of potassium only the potassa action has as yet been noticed, whereas bromid of sodium has none other than a sodium chlorid action, experiments on healthy people giving different results. (Krosz, 1876). One observed the same actions with potassium bromid as after potassium chlorid, (Saison); another gives to the first particular effects, not due to potassa, and therefore also seen after the administration of sodium bromid, but not after potassium chlorid, (Krosz), consisting of tiredness, debility, sleepiness, dullness of memory, thick speech and lowered reflex-sensibility of the gums. Also the observations on the sick, namely, in epileptics, give no corroborative data. The absence of epileptic attacks after the use of potassium bromid is supported by all observers. The attacks have reappeared after the remedy was dicontinued. Still, cures have been noticed. (Begbie, Bennett, Voisin).

Concerning the other bromids and the potassa salts in general, according to the statements of most of the authorities potassium bromid is not surpassed by any other preparation. But even potassium chlorid has not been found inert. In fact, one observer ascribes to it the same importance as potassium bromid. (Sander). Accord ng to others, it has but a slight influence on the epileptiform seizures, or, in fact, increases them. (Stark). In regard to sodium bromid most observers agree that this combination, like potassium bromid, prevents the seizures in epileptics, others in a lesser degree.

About the same is true of the use of the several salts in nervous insomnia and general reflex excitability. However, in these cases it is still more difficult to obtain an opinion, because very different psychic phenomena play an important part in the production of the sleep and can be confounded with the soporific effect of a very indifferent remedy. (Amburger, 1852.)

In recapitulation of the above, it is shown that a bromid action, *i. e.*, a particular action of the bromin in its salts, is noticed only in man, and particularly in the treatment of epilepsy and nervous conditions.

In isolated cases severe acute symptoms of poisoning have been observed after a few or in fact after a single large dose of bromid of potassium and bromid of sodium, being generally denoted by intense gastric and intestinal irritation, but also by paralyses in the territories of the central nervous system. More frequent and distressing is the more chronic poisoning which appears after the use of these salts for a month and disappears after the discontinuance of the same.

The symptoms affect the brain principally and are: weak memory, impaired sight and hearing, diminished sensibility of the skin, staggering gait, somnolence, delirium and even maniacal seizures; further through local salt action disturbances of gastric and intestinal functions, namely inferior digestion and as a consequence of the latter anemia and emaciation, are observed, which may also be caused by the general action of the salt on metabolism.

The lowering of the pulse rate, which is absent in sodium bromid, is probably due to potassa. Finally the bromids, like the iodid of potassium, occasion a cutaneous exanthem in the form of acne nodules, as also catarrhal conditions. Of these the respiratory mucous membrane seems to be the part so affected; at least, after the use of potassium bromid, particularly in women and children, violent paroxysms of coughing have been noticed.

CHAPTER XIII

In Memoriam

JOHN E. FACKLER, M. D.

John Ehrstine Fackler was born September 30, 1836, in Miami county, Ohio. He was the son of George and Elizabeth (Ehrstine) Fackler and grandson of George Fackler. His grandparents emigrated from Pennsylvania early in this century and settled in the Miami Valley near Dayton, Ohio; but the original American ancestors came from Strasburg, Germany.

His childhood and youth were spent on the farm; but early in life he developed a taste and aptness for learning which no doubt led him into his chosen profession. "He was educated in the common schools of the county, at the Normal school of Troy, Ohio, and also received instruction from private tutors. He taught school in early life, and in 1859 began the study of medicine at Piqua, Ohio, under the direction of G. Volney Dorsey, M. D.; attended two courses of lectures in the Medical College of Ohio, Cincinnati, and received his degree therefrom July 6, 1863.

Dr. Fackler began the practice of medicine at Eldorado, Ohio, March 9, 1861, where he continued four months; afterwards was located at Webster, Ohio, until 1870; and then at Versailles, Ohio, until his death, January 7, 1898. He passed the army medical examining board at Louisville, Ky., in September, 1864, but did not enter the military service. He was a member of the Darke County Medical Society in the days of its activity, and since 1879 of the

Ohio State Medical Society. He was one of the organizers of the Versailles Medical Association and its first president. He was a member of the Independent Order of Odd Fellows; for eight years a member and secretary of the Board of Education of Versailles, Ohio; and for four years a member of its council. He served sixteen years as superintendent of Sunday School; and in all the varied interests of the people, educational and religious, he took an active part.

Dr. Fackler was a physician of no ordinary ability. His perception was keen, his mind comprehensive, and he was scientific and original in thought. An industrious student and discriminative reader, he kept himself well informed of what was really progressive in medicine and the collateral sciences. He was quick to perceive principles and with them he endeavored to solve the problems of medical science. He was among the foremost to accept the germ theory of disease, and long before the profession gave approval thereto he adopted the antiseptic treatment of typhoid fever. On this line also he sought and believed he had found a successful remedy for the treatment of diphtheria, which discovery he gave to the profession in a paper on "The Treatment of Diphtheria," read before this society at its meeting in Columbus in May, 1896.

Dr. Fackler was widely known and trusted as a careful, conscientious and able physician, ever ready, and firm in the discharge of his duty.

He had a high appreciation of the dignity of the medical profession. He believed in its lofty aim and serious mission. He deprecated the petty jealousies that sometimes estrange physicians, believing them hurtful alike to the people and the profession, and foreign to the high purpose of a noble calling. He was an agreeable and valuable consultant; and to those of the profession who sought private assistance he gave of his knowledge and assistance in a truly fraternal spirit.

Dr. Fackler was a man of humble manner, strict in-

tegrity, and deep religious conviction. He was a member in succession of the Reformed, Lutheran and Methodist Episcopal churches, and died in full faith of future and eternal life in the Saviour in whose word he had believed and trusted.

The last years of his life were years of much suffering, which he bore and through which he labored with much patience and little complaint. A few months prior to his death he recognized the malignant nature of his malady, and with a quiet and willing submission worthy of his character and his faith he calmly and patiently awaited the inevitable hour.

He is gone. Let us cherish his memory; and may his good deeds and bright example live in the lives of those he helped to make better.

(COPY.)

RESOLUTIONS

in Memory of Dr. J. E. Fackler, adopted by the Versailles Medical Association

Whereas, on the 7th day of January, 1898, J. E. Fackler, M. D., a member and president of the Versailles Medical Association, was taken from our midst by the silent hand of death, be it

Resolved, That the medical profession has lost an able and true physician; that we, as a society, deeply regret the loss of a bright and active member, one whose absence from our councils will be keenly felt and whose association was always enjoyed; that his family has lost a true husband and father and the community an exemplary christian and gentleman.

Be it further

Resolved, That we extend our heartfelt sympathy to his family in their hours of sorrow, and that a copy of these resolutions be sent to the family, and that they also be engraved upon the minutes of the Association.

J. S. NIEDERKORN,
Sec. Versailles Medical Association.

CHAPTER XIV

PERMANENT MEMBERS

of the Ohio State Medical Society

OAPITALIZED: Life members.

Local Secretaries will please notify the Secretary of errors or omissions, and forward obituary notices with their annual catalogues.

Abbott, C. N., Academy of Medicine.....Cincinnati, 1892
Adams, P. N., Montgomery Co. Medical Society....Dayton, 1885
Adair, Samuel G., Washington Co. Medical Society..Beverly 1893
Albl, Michael A., Cuyahoga Co. Medical Society..Cleveland, 1892
Albers, John G.....Fulda, 1898
Albright, Charles W.....Milo, 1898
Alcorn, E. G., Gallia Co. Medical Society.....Gallipolis, 1895
Alcorn, John B., Gallia Co. Medical Society.....Gallipolis, 1894
Aldrich, Chas. J., Cuyahoga Co. Medical Society..Cleveland, 1891
Aldrich, Daniel B., Ashtabula Co. Medical Society..Harbor, 1892
Allard, Lorenzo D., Pike Co. Medical Society..Portsmouth, 1894
Allen, C. O.....Haydenville, 1895
Allen, Dudley P., Cuyahoga Co. Medical Society..Cleveland, 1885
Allen, George M., Academy of Medicine.....Cincinnati, 1892
Allen, S. E., Academy of Medicine.....Cincinnati, 1892
Andre, Orrin C., Hempstead Mem'l Ac'd'y of Med..Waverly, 1888
Anderson, L. C.....Greenville, 1898
Archer, J. R.....N. Baltimore, 1892
Armentrout, Lyman W.....Mt. Vernon, 1892
Armstrong, C. L., Academy of Medicine.....Cincinnati, 1892
Axline, Chas. Z., Hildreth District Med. Society..Fultonham, 1884
Ayres, S. C., Academy of Medicine.....Cincinnati, 1877
Backus, L. C., Tri-State Medical Society.....Fayette, 1895
Bain, Frank D., Northwestern Ohio Medical Ass'n..Kenton, 1885

Baker, A. R., Cuyahoga Co. Medical Society.....Cleveland, 1886
Baker, J. P., Hancock Co. Medical Society.....Findlay, 1891
Baker, William O., N. E. O. M. A.....Louisville, O., 1882
Baker, E. W.....Clyde, 1898
Baldwin, J. F., Academy of Medicine.....Columbus, 1875
Ballinger, J. B.....Webster, 1880
Barker, Fred. D.....Dayton, 1898
Barnes, J. W., Ross Co. Medical Society.....Columbus, 1892
Barnes, T. S., Ross Co. Medical Society.....Chillicothe, 1890
Barnhill, James U., Academy of Medicine.....Columbus, 1884
Barrere, D. M., Montgomery Co. Medical Society...Dayton, 1884
Barton, Robt. S., Tuscarawas Co. Medical Society....Baltic, 1898
Bates, F. L., Allen Co. Medical Society.....Lima, 1890
Battles, Mary M., Ashtabula, Lake & Geauga Co. M. S.....
.....Ashtabula, 1897
Bauer, M. M., N. E. O. M. A.....Lake, 1884
BEACH, J. N., Central Ohio M. S., Madison Co..Jefferson, 1854
Beardsley, C. E., N. W. O. M. A.....Ottawa, 1869
Becker, Bernard, Toledo Medical Association.....Toledo, 1892
Beck, John S., Montgomery Co. Medical Society....Dayton, 1879
Beckwith, Seth W., Toledo Medical Association.....Toledo, 1892
Beers, A. M., Tuscarawas Co. Med. Society..Newcomerstown 1882
Belt, R. C., Miami Valley Medical Society.....Milford, 1892
Belt, John H., Cleveland Medical Society.....Cleveland, 1897
Benner, C. T., N. W. O. M. A.....Tiffin, 1891
Bennett, W. C., Morrow Co.....Iberia, 1892
Bennett, C. A., Clermont Co. Medical Society..Withamsville 1892
Bertolette, Harry B., Wayne Co. Medical Society....Shreve, 1896
Bessey, J. Mortimer, Toledo Medical Ass'n.....Toledo, 1887
Bethauser, C. M., Academy of Medicine.....Columbus, 1895
Bevington, H. S., Crawford Co. Med. Soc..Sulphur Springs, 1892
Bigham, J. G., Holmes Co.....Millersburg, 1897
Bird, Edw. H., N. W. O. M. A.....Dupont, 1892
Bivans, W. A., Brown Co. Medical Society.....New Hope, 1892
Blackburn, M. E., Academy of Medicine.....Columbus, 1895
Blair, B. H., Warren Co. Medical Society.....Lebanon, 1892
Blake, F. W., Academy of Medicine.....Columbus, 1892
Blake, Wm. H., Central Ohio Medical Society..Shadeville, 1878
Bland, J., Crawford Co. Medical Society..... .....Bucyrus, 1892
Blankenhorn, H., U. M. A. N. E. O.....Orrville, 1895
Blazer, H. E., Eastern Ohio Medical Ass'n.....Salineville, 1897
Bleile, A. M., Academy of Medicine.....Columbus, 1882
Blickensderfer, Jos., Tuscarawas Co. M. S..New Philadelphia, 1897

Bodman, Lewis H., Toledo Medical Ass'n.....Toledo, 1892
Boerstler, George W.....Lancaster, 1870
Bond, John W., Toledo Medical Association.....Toledo, 1892
Boggess, E. M., Fayette Co. Med. Soc...Washington, C. H., 1892
Bohl, John, Sr., Washington Co. Medical Soc...Watertown, 1892
Bonifield, C. L., Academy of Medicine.....Cincinnati, 1892
Bonner, C. A., Montgomery Co. Medical Society..Dayton, 1892
Bonner, Horace, Montgomery Co. Med. Soc.....Dayton, 1890
Boone, D. W., Belmont Co. Medical Society.....Bellaire, 1890
Boone, Jos. S., Belmont Co. Medical Soc..Powhattan Point, 1892
Bowen, A. H., Academy of Medicine.....Columbus, 1878
Boylan, A., Union Co.....Milford Centre, 1878
Boyd, James P., N. E. O. M. A.....Akron, 1892
Bradford, W. N.....Cambridge, 1896
Brady, M. B., Academy of Medicine.....Cincinnati, 1892
Brand, Walter W., Toledo Medical Association.....Toledo, 1896
Brannan, T. H., Tuscarawas Co. Medical Soc..Canal Dover, 1884
Brashear, B. B., Cuyahoga Co. Medical Society....Cleveland, 1896
Brayton, Asa., N. W. O. M. A.....Carey, 1892
Brent, C. P., Academy of Medicine.....Cincinnati, 1892
Brigham, O. S., Toledo Medical Association.....Toledo, 1892
BRINKERHOFF, D. H., Sandusky Co. Med. Soc.Fremont, 1853
Brockett, A. J., Cleveland Med. Soc.....Cleveland, 1874
Brown, E. O. S., Pike Co. Medical Society.....Beaver, 1895
Brown, H. M., Academy of Medicine.....Cincinnati, 1882
Brown, J. A.....Germantown, 1886
Brown, J. E., Academy of Medicine.....Columbus, 1892
Brown, R. A.....Circleville, 1896
Bruehl, Gust., Academy of Medicine.....Cincinnati, 1892
Brundage, L. A., Greene Co. Medical Society.....Xenia, 1892
Bruner, Wm. E., Cleveland Medical Society.....Cleveland, 1897
Brush, Edmund C., Hildreth District Med. Soc..Zanesville, 1878
Buckingham, John M., Clarke Co., Medical Soc..Springfield, 1885
BUCKNER, J. H., Academy of Medicine.....Cincinnati, 1863
Buechner, W. L., Mahoning Co. Medical Soc..Youngstown, 1879
Bunn, Jas. W., Adams Co. Medical Society....West Union, 1872
Bunts, Frank E., Cleveland Med. Soc..... ..Cleveland, 1892
Burrows, S. S., Ashtabula Co. Med. Soc.....Geneva, 1895
Burnham, R. D., Erie Co.....State Soldier's Home, 1898
Butler, Geo. W.....Columbus, 1869
Buttemiller, J. C., Academy of Medicine.....Cincinnati, 1897

Butler, Geo. O., Cleveland, 1870, died in November, 1897, but is omitted from Secretary's list of deaths on page 23.

Caldwell, John L., Pike Co. Medical Soc.....Waverly, 1894
Caldwell, J. S., Academy of Medicine.....Cincinnati, 1892
Calhoun, W. M., Union M. A. Columbus....East Liverpool, 1892
Callinan, D. F.....Corning, 1892
Calvin, J. H., Erie Co. Medical Society.....Salem, 1891
Campbell, Oscar B., Cleveland Med. Soc..... ..Cleveland, 1892
Carmichael, W. A., Miami Valley Med. Soc.....Loveland, 1871
Carpenter, E. G., Cleveland Med. Soc... .....Columbus, 1892
Carpenter, Julia W., Academy of Medicine.....Cincinnati, 1879
Carrick, Anthony L., Academy of Medicine.....Cincinnati, 1871
Carson, Archibald I., Academy of Medicine.....Cincinnati, 1892
Carson, Frank D., Holmes Co. Medical Society....Benton, 1892
Case, Freeman D., Ashtabula Co. Medical Soc..Ashtabula, 1886
Chadwick, Leroy S., Cuyahoga Co. Medical Soc..Cleveland, 1892
Chamberlin, Chas. S.. Trumbull Co. Medical Soc..Kinsman, 1892
Chaney, S. F., Highland Co.....Pricetown, 1898
Chapman, Byron, N. E. O. M. A.....Copley, 1885
Chapman, Wm. C., Toledo Medical Ass'n.....Toledo, 1875
Chesney, John A., Crawford Co. Medical Soc.....Bucyrus, 1892
Chidester, C. W.....Delaware, 1895
Chisholm, H., Marion Co. Medical Society.....Marion, 1895
Church, Walter F., Sandusky Co. Medical Soc..Gibsonburg, 1897
Clapp, Harold T., Cleveland Medical Sociey.....Cleveland. 1891
Clark, C. F., Academy of Medicine.....Columbus, 1885
Clarke, Ida, Mahoning Co. Medical Society..Youngstown, 1889
Clark, Frank S., Cleveland Medical Society.....Cleveland. 1892
Clark, John H., Champaign Co. Med. Soc..Mechanicsburg, 1869
Clark, Myron S., Mahoning Co. Med. Soc.....Youngstown, 1879
Clay, W. P.....Elgin, 1896
Cleaver, J. V., Summitt Co. Medical Society.....Akron, 1892
Clemson, G. W., Perry Co. Medical Society....Thornville, 1896
Clouse, Geo. M., Academy of Medicine.....Columbus, 1892
Coates, B. O., Cleveland Medical Society.....Cleveland, 1898
Cole, A. P., Ross Co. Medical Society.....Chillicothe, 1895
Cole, Wm. N., Academy of Medicine.....Columbus, 1896
Coleman, N. R., Academy of Medicine.....Columbus. 1875
Coldham, Wm. W., Toledo Medical Ass'n.....Toledo. 1892
Collamore, Geo. A., Toledo Medical Association....Toledo, 1880
Collins, B. F., Eastern Ohio Medical Ass'n.....Toronto, 1895
Collins, Edgar F.....Mt. Sterling, 1896
Collins, Milton H., Clarke Co. Medical Soc..So. Charleston, 1890
Collins, John W.....Steubenville, 1894
Colville, George H., Belmont Co.....Harrisville. 1887

Combs, John S., Clermont Co. Medical Society..Owensville, 1892
Conklin, W. J., Montgomery Co. Medical Society...Dayton, 1868
Conard, George R., Clinton Co. Medical Soc..New Vienna, 1890
Conden, John F., Miami Co. Medical Society.....Morrow, 1892
Cone, J. E., Mahoning Co. Medical Society....Youngstown, 1889
Conn, Eli, Summit Co. Medical Society.....Akron, 1887
CONNER, PHINEAS S., Academy of Medicine.Cincinnati, 1868
Cook, G. F., Butler Co. Medical Society.....Oxford, 1885
Cook, J. E., Cleveland Medical Society.....Cleveland, 1895
Cooper, Albert, Central Ohio Medical Society....Columbus, 1881
Cooperrider, C. A., Academy of Medicine.....Columbus, 1892
Cope, E. C., Belmont Co. Medical Society.....Cope, 1895
Corbin, Lee, Montgomery Co. Medical Society.....Dayton, 1892
Corlett, Wm. T., Cleveland Medical Society.. ....Cleveland, 1882
Corson, O. M., Butler Co. Medical Society.....Middletown, 1879
Cosgrove, Thos., Toledo Medical Ass'n.....Toledo, 1892
COTTON, J. D., Washington Co. Medical Society..Marietta, 1852
Courtright, D. V., Pickaway Co.....Circleville, 1898
COURTRIGHT, GEO. S.....Lithopolis, 1867
Cowan, F., N. C. O. Medical Society.....Ashland, 1896
Cowell, Willard M.....Columbus, 1898
Cox, J. M., Ross Co. Medical Society.....South Salem, 1877
Craig, J. Harvey, N. C. O. Medical Society.....Mansfield, 1886
Crane, A. M., Marion Co. Medical Society.....Marion, 1881
Craver, S. Belle, Toledo Medical Ass'n.....Toledo, 1892
Crawford, A. J.....Gloucester, 1896
Creps, Adolphus H., Allen Co. Medical Soc..West Minster, 1892
Crider, Chas. L., Muskingum Co. Medical Soc...Zanesville, 1894
Crile, Geo. W., Cleveland Medical Society.....Cleveland, 1892
Crossland, Jeff C., Muskingum Co. Medical Soc..Zanesville, 1890
Crump, A. A., Jr., Holmes Co. Medical Society..Millersburg, 1892
Culbertson, Louis Rogers.....Zanesville, 1896
Curry, John H., Toledo Medical Ass'n.....Toledo, 1892
Curry, Frank C., Cincinnati Academy of Medicine..Milford, 1892
Cushing, Edward F., Cuyahoga Co. Medical Soc..Cleveland, 1892
CUSHING, H. K., Cuyahoga Co. Medical SocietyCleveland, 1857
Dandridge, N. Pendleton, Academy of Medicine..Cincinnati, 1871
Darrah, Jos. Wilson.....Martin's Ferry, 1897
Davidson, N. P., Union Co. Medical Society.....Hilliards, 1890
Davison, John F., Northern Ohio Med. Soc....No. Amherst, 1893
Davisson, J. Alexander, Preble Co. Medical Soc..Eldorado, 1896
Davis, Ben., Clark Co. Medical Society.....New Carlisle, 1895
Davis, Gilman R., Lawrence Co. Medical Society...,Ironton, 1896

De La Barre, Paul.....Port Clinton, 1892
Death, H. J., Warren County Medical Society.....Franklin, 1892
DeCourcy, W. E., Academy of Medicine.....Cincinnati, 1892
Denman, Wm. C., Marion Co. Medical Society.....Marion, 1882
Dennis, W. H.....Burbank, 1895
Deuschle, W. D., Academy of Medicine.....Columbus, 1885
DeVilbiss, Allen, Toledo Medical Ass'n.....Toledo, 1887
Dick, W. L., Academy of Medicine.....Columbus, 1892
Dickey, Thos. A., Butler Co. Medical Society..Middletown, 1879
Dine, C. L., N. W. O. M. A.....Minster, 1893
Dixon, M. F., Academy of Medicine.....Columbus, 1895
Dixon, W. A., Brown Co. Medical Society.....Ripley, 1889
Dolina, J. F., Montgomery Co. Medical Society....Dayton, 1892
Donnelly, James, Toledo Medical Ass'n.....Toledo, 1892
Dorman, H. W., Ashtabula Co. Medical Society....Harbor, 1886
Dorsey, Jos. F.....Dresden, 1894
Downs, Samuel .....Waterville, 1876
Dunlap, C. O.....Athens, 1881
Duncan, A. M., Crawford Co. Medical Society.....Bucyrus, 1886
Duncan, James A., Toledo Medical Ass'n.....Toledo, 1874
Dunham, J. M., Academy of Medicine.....Columbus, 1895
Dunham, W. H., Academy of Medicine.....Cincinnati, 1892
Dutton, C. F., Cuyahoga Co. Medical Society....Cleveland, 1880
Eakins, Jehu, Gallia Co. Medical Society.....Patriot, 1894
Eddy, Chas. W., Washington Co. Medical Society..Marietta, 1888
Edwards, R. C.....W. Carlisle, 1895
Eichberg, Jos., Academy of Medicine.....Cincinnati, 1882
Ellis, Samuel B., Montgomery Co. Medical Society..Dayton, 1897
Ely, J. S., Belmont Co. Medical Society.....Barnesville, 1892
Emerick, E. J., Central Ohio Medical Society....Columbus, 1895
Emmons, D. R., Champaign Co. Medical Soc..N. Lewisburg, 1895
Ervin, N. B., Sandusky Co. Medical Society....Gibsonburg, 1891
Erwin, J. J., Cleveland Medical Society.....Cleveland, 1898
Esch, Jos. P., Erie Co. Medical Society.....Huron, 1892
Evans, A. E., Central Ohio Medical Society.....Columbus, 1882
Evans, Otho, Warren Co. Medical Society.....Franklin, 1892
Evans, Geo. B., Montgomery Co. Medical Society....Dayton, 1892
Everts, Orpheus, Academy of Medicine.....Cincinnati, 1885
Faber, Chas. A., Toledo Medical Ass'n.....Toledo, 1892
Farnsworth, G. B., Cleveland Medical Society....Cleveland, 1895
Fassig, J. M., Muskingum Co. Medical Society....Zanesville, 1893
Faucett, R. C., Union Med. Ass'n of Columbiana..N. Jackson, 1896
Feil, G. R., Cleveland Medical Society.....Cleveland, 1897

Fels, Geo. W., Academy of Medicine.....Cincinnati, 1892
Fella, F. J., Toledo Medical Ass'n.....Toledo, 1892
Finley, Mary Jordan, Academy of Medicine.....Mansfield, 1897
Fisher, A. W., Toledo Medical Ass'n.....Toledo, 1892
Fisher, W. H., Toledo Medical Ass'n.....Toledo, 1892
Fisher, P.....Cincinnati, 1892
Fitzpatrick, T. V., Academy of Medicine.....Cincinnati, 1890
Fitzsimmons, J. F., Crawford Co. Medical Society..Bucyrus, 1892
Fletcher, Mordecai H., Academy of Medicine....Cincinnati, 1892
Flemming, J. C.....Carlisle, 1892
Flower, W. R., Ashtabula Co. Medical Society...Ashtabula, 1895
Floyd, J. C. M., Jefferson Co. Medical Soc.....Steubenville, 1884
Foertmeyer, C. H., Academy of Medicine.....Cincinnati, 1892
Fogel, L. J.....Cincinnati, 1892
Foltz, Tobias H., N. W. O. M. A.....Lima, 1892
Folk, Peter.....Deavertown, 1894
Forcheimer, F., Academy of Medicine.....Cincinnati, 1892
Formorin, J. L., Clermont Co. Medical Society...Marathon, 1892
FORBES, S. F., Toledo Medical Ass'n.....Toledo, 1856
Foshay, P. M., Cleveland Medical Society.....Cleveland, 1893
Foster, G. F., Ross Co. Medical Society....Kingston Centre, 1882
Fowler, Silas W.....Delaware, 1873
Fox, J. F., Tuscarawas Co. Medical Soc..New Philadelphia, 1895
Fox, Curtis L., Ashtabula Co. Medical Society..Kingsville, 1897
Fraker, H. C., Academy of Medicine.....Columbus, 1895
Francis, A. W., Brown Co. Medical Society.....Ripley, 1892
Fraser, J. M., Cuyahoga Co. Medical Society.....Cleveland, 1892
Fraunfelter, J., N. E. O. M. A.....Canton, 1886
French, Jas. M., Academy of Medicine.....Cincinnati, 1892
FULLER, S. W.....Bellefontaine, 1853
Fullerton, Erskine B., Academy of Medicine.....Columbus, 1894
Gage, Rawson S., Washington Co. Medical Society..Qualey, 1892
Gahm, J. L., Hempstead Academy of Medicine.....Jackson, 1895
Gale, Geo. T., Washington Co. Medical Society....Newport, 1888
Galloway, C. M., Greene Co. Medical Society.....Xenia, 1888
Galloway, W. A., Greene Co. Medical Society.....Xenia, 1890
Gardiner, W. G., N. W. O. M. A.....Toledo, 1892
Gehritt, T. M., N. W. O. M. A.....Deshler, 1892
Getzloff, B., Shelby Co. Medical Society.....Wapakoneta, 1895
Geyer, Jos. L., Muskingum Co. Medical Society..Norwich, 1892
Gibbon, H. B., N. W. O. M. A.....Tiffin, 1891
Gillette, Wm. J., Toledo Medical Ass'n.....Toledo, 1892
Gilliam, D. Tod., Academy of Medicine.....Columbus, 1873

Glenn, W. W., Highland Co. Medical Society.....Hillsboro, 1895
Goebel, Anna M., Allen Co. Medical Society.....Lima, 1892
Goetz, F. E., Cleveland Medical Society.....Cleveland, 1892
Goodhue, Geo., Montgomery Co. Medical Society...Dayton, 1884
Goode, B. P., Academy of Medicine.....Cincinnati, 1892
Gores, F. C., Academy of Medicine.....Cincinnati, 1892
Gordon, Patrick A.....Junction City, 1894
GORDON, T. W., Brown Co. Med. Soc.....Georgetown, 1849
Goss, C. W.....Lancaster, 1895
Goss, J. H., Central Ohio Medical Society.....Lancaster, 1884
Graefe, Wm., Erie Co. Medical Society.....Sandusky, 1874
Graefe, Chas., Erie Co. Medical Society.....Sandusky, 1891
Granger, Francis M., Highland Co. Medical Soc....Russell, 1881
Gray, C. G., Lawrence Co. Medical Society.....Ironton, 1896
Gray, Francis C., Montgomery Co. Medical Soc.....Dayton, 1894
Green, Henry S., Morrow Co.....Cardington, 1878
Greene, D. W., Montgomery Co. Medical Society...Dayton, 1882
Griffis, F. C.....Mt. Gilead, 1896
Grimm, Adolph, Academy of Medicine.....Cincinnati, 1892
Groves, J. E., Tuscarawas Co. Medical Society..Uhrichsville, 1884
Guerin, Z. F., Central Ohio Medical Society.....Columbus, 1884
Guiss, W. H., Crawford Co. Medical Society.....Tiro, 1895
Haldeman, John S., Muskingum Co. Med. Soc....Zanesville, 1885
Halderman, S. S., Hempstead Med. Academy. .Portsmouth, 1896
Hall, E. V.....Convoy, 1898
Hall, Rufus B., Academy of Medicine.....Cincinnati, 1884
Hall, C. T., Warren Co. Medical Society.....Mason, 1892
Hall, Willard A., Ross Co. Medical Society.....Chillicothe, 1896
Hamann, C. A., Cleveland Medical Society.....Cleveland, 1895
Hamer, W. W., American Medical Ass'n.....Bellefontaine, 1895
Hamilton, Horatio A., Wood Co. Medical Soc..Perrysburg, 1886
Hamilton, W. D., Academy of Medicine.....Columbus, 1886
Hamilton, L. D., Marion Co. Medical Society.....Marion, 1896
Hamilton, C. S., Academy of Medicine.....Columbus, 1891
Hancock, W. D., Butler Co. Medical Society.....Milville, 1892
Haney, Josiah C.....Dalton, 1896
Hanson, D. S., Cleveland Medical Society.....Cleveland, 1898
Hardy, Martin V., Washington Co. Medical Soc...Marietta, 1892
Hardy, John C., Washington Co. Medical Society..Marietta, 1886
Hardy, Irene.....Massillon, 1897
Hart, Romeyn B., Jr., Washington Co. Med. Soc..Marietta, 1892
Hart, C. S.....Marietta, 1895
Hart, Samuel, Washington Co. Medical Soc.....Marietta, 1887

Hartman, Geo. W., N. W. O. M. A.....Wauseon, 1887
Hartman, S. D., Miami Co. Medical Soc...Tippecanoe City, 1874
Harrison, E. B., N. W. O. M. A.....Napoleon, 1869
HARMON, JULIAN, Trumbull Co. Medical Soc..Warren, 1857
Harmon, J. D., Trumbull Co. Medical Society.....Warren, 1895
Harper, E. A.....Columbus, 1896
HART, B. F., Washington Co. Medical Society....Marietta, 1854
Hasencamp, Oscar, Toledo Medical Ass'n.....Toledo, 1891
Hathaway, Harrison, Toledo Medical Ass'n.....East Toledo, 1874
Hatch, Chas. A.....Newark, 1893
Hawley, Edwin P., Cuyahoga Co. Medical Soc....Cleveland, 1892
Hayes, J. D., Perry Co. Medical Society.....Somerset, 1895
Haynes, J. T., Erie Co. Medical Society.....Sandusky, 1893
Haynes, J. Purcell, Toledo Medical Ass'n.....Toledo, 1892
Hayward, E. T.....Waterford, 1896
Heaton, Townsend, Academy of Medicine.....Aberdeen, 1892
Heffner, G. W.....Circleville, 1895
Heiter, Carl, Erie Co. Medical Society.....Sandusky, 1875
Heidrick, Louis W., Toledo Medical Ass'n.....Toledo, 1892
Hendershot, B. C., Tuscarawas Co. M. S..New Philadelphia, 1897
HENDERSON, D. W.....Marysville, 1856
Henderson, Robert, Champaign Co. Medical Soc...Urbana, 1892
Henderson, Geo. W., N. W. O. M. A.....West Cairo, 1892
Hendley, F. W., Academy of Medicine.....Cincinnati, 1892
Henry, A. G., N. W. O. M. A.....North Baltimore, 1892
HENDRIXSON, HUGH, Academy of Med...Columbus, 1868
HERRICK, H. J., Cleveland Medical Society....Cleveland, 1868
Herrick, H. B., Cleveland Medical Society.....Cleveland, 1895
Hersh, E. G., Hancock Co. Medical Society.....McComb, 1892
Heston, Jos. Z.....Columbus, 1898
Hewetson, H. L., Tuscarawas Co. Med. Soc... .Uhrichsville, 1895
Hewetson, Alex. H., Belmont Co.....St. Clairsville, 1894
Hiestand, E. B., N. W. O. M. A.....Kenton, 1884
Hillbish, Fred S.....Fremont, 1878
Hill, Wm. W., Wood Co. Medical Society.....Weston, 1892
Hillkowitz, Wm., Academy of Medicine.....Cincinnati, 1892
Hines, J. Arthur.....Van Wert, 1879
Hiner, S. B., Allen Co. Medical Society.....Lima, 1874
Hinckley, H. D., Butler Co. Medical Society.....Cincinnati, 1887
Hixon, M. M., N. W. O. M. A.....Dupont, 1887
Hobbs, Wilbert A., Union Co. Medical Soc..East Liverpool, 1889
Hobson, John A., Belmont Co. Medical Society..Flushing, 1891
Hobson, J. F., Cleveland Medical Society.....Cleveland, 1897

Hoege, G. L., N. W. O. M. A.....Fostoria, 1895
Hoeltge, A. E., Academy of Medicine.....Cincinnati, 1892
Hoff, Jos. W., Meigs Co. Medical Society.....Pomeroy, 1872
Holliday, W. W., Cuyahoga Co. Medical Society..Cleveland, 1892
Holliday, Benj. W., Cuyahoga Co. Medical Soc..Cleveland, 1875
Holcomb, Calvin B., Perry Co.....Corning, 1898
Holcomb, Leroy S.....Pennville, 1894
Holdren, G. W., Fayette Co. Medical Society..Bloomingburg, 1892
Hollister, Geo. A.....Toledo, 1897
Holman, A. W.....Circleville, 1895
Holmes, C. R., Academy of Medicine.....Cincinnati, 1892
Holston, J. G. F., Muskingum Co. Medical Soc..Zanesville, 1892
Homes, W. W.....Columbus, 1895
Hoover, C. F., Cleveland Medical Society.....Cleveland, 1896
Hoover, Collins M., Union Medical Society.....Alliance, 1885
Hoover, Thos. C., Academy of Medicine.....Columbus, 1891
Hoppe, H. H., Academy of Medicine.....Cincinnati, 1892
Hottendorf, Louis P., Academy of Medicine.....Cincinnati, 1892
Hous, Geo. W., Montgomery Co. Medical Society...Clayton, 1892
Hough, C. A., Warren Co. Medical Society.....Lebanon, 1890
Hough, Wayland S., Summit Co. Med. Soc..Cuyahoga Falls, 1875
House, A. F., Cleveland Medical Society.....Cleveland, 1880
House, Chas. F.....Painesville, 1897
Howard, W. T., Cleveland Medical Society.....Cleveland, 1895
Howard, A. B., Cleveland Medical Society...Cuyahoga Falls, 1897
Howell, J. Morton, Fayette Co. Med. S..Washington, C. H., 1892
Howells, James Owen, Belmont Co.....Bridgeport, 1897
Hubbard, Thomas, Toledo Medical Ass'n.....Toledo, 1889
Hudson, J. F., N. E. O. M. A.....Canton, 1892
Hughes, E. E.....Oak Hill, 1895
Hughes, F. M.....Vermillion, 1892
Hughes, D. E.....Delaware, 1895
Hughey, J. W., Fayette Co.....Chillicothe, 1892
Hulick, John W., Clarke Co.....Springfield, 1898
Hulin, O. W., Union Medical Ass'n of N. E. O..Greenford, 1895
Humiston, Wm. H., Cleveland Medical Society...Cleveland, 1880
Humphrey, C. H., Montgomery Co. Medical Soc....Dayton, 1892
Hunt, A. H.....Wooster, 1892
Hurd, A., Hancock Co. Medical Society.....Findlay, 1870
Hussey, M. F., Shelby Co. Medical Society.....Sidney, 1892
Huston, W. O.....Bellaire, 1894
HYATT, E. H.....Delaware, 1862
Ikirt, G. P., Champaign Co.....East Liverpool, 1882

Ingersoll, J. M., Cleveland Medical Soc.....Cleveland, 1897
Ireland, W. E., Fayette Co. Medical Soc., Washington C. H., 1887
Ireland, S. A., Fayette Co. Medical Soc..Washington, C. H., 1892
Ireton, E. C.....Marathon, 1892
Irvin, John W., Ashland Co.....Magnetic Springs, 1896
Jacobs, Harold H., N. E. O. M. A.....Akron, 1892
Jacobs, M. M., Butler Co. Medical Soc.....Hamilton, 1895
Jacobs, W. C.....Akron, 1892
James, W. S., Cleveland Medical Society.....Cleveland, 1897
Jamison, J. Ross, Wayne Co.....Apple Creek, 1898
Jenkins, M. J., Central Ohio Medical Soc.....Plain City, 1895
Jenks, Wm. O., Cuyahoga Co.....Nottingham, 1892
Jenner, Henry G., Montgomery Co. Medical Soc....Dayton, 1897
JENNINGS, ELLIS, Montgomery Co. Med. Soc..Dayton, 1867
Jennings, Gainor, Miami Co. Medical Soc.....West Milton, 1892
Jewett, H. S., Montgomery Co. Medical Society....Dayton, 1871
Johnson, Fred L.....Worthington, 1897
Johnston, Alice M., Central Ohio M. S.....Columbus, 1895
Jones, Wm. A.....Toledo, 1892
Jones, L. M., Greene Co. M. S.....Jamestown, 1892
Jones, J. D., Cuyahoga Co. Med. Society.....Cleveland, 1870
Jones, Geo. E., Academy of Medicine.....Cincinnati, 1892
JONES, R. E., N. W. O. M. A.....Gomer, 1863
JONES, T. W.....Columbus, 1847
Joseph, Leopold, Academy of Medicine.....Cincinnati, 1892
Judkins, Wm., Academy of Medicine.....Cincinnati, 1892
Judkins, C. P., Academy of Medicine.....Cincinnati, 1887
Judkins, Jas. A.....Barnesville, 1894
Judy, C. L., Montgomery Co. Medical Society..Miamisburg, 1896
Junkerman, Geo. S., Academy of Medicine.....Cincinnati, 1892
Kaestlen, Samuel E, Cleveland Medical Society...Cleveland, 1892
Kahler, J. Frank, Guernsey Co.....Quaker City, 1898
Kahn, L., Academy of Medicine.....Columbus, 1895
Kammann, Albert A., Academy of Medicine.....Cincinnati, 1892
Kautz, J. W., Brown Co. Medical Society.....Arnheim, 1892
KAY, ISAAC, Clarke Co. Medical Society.....Springfield, 1853
Keck, Peter A., Academy of Medicine.....Cincinnati, 1892
Keller, B. T., Fayette Co. Medical Society....Bloomingburg, 1891
Keller, Thos. F., N. W. O. M. S.....Tiffin, 1887
Kemp, Lucia, Crawford Co. Medical Society.....Bucyrus, 1892
Kendig, Elias V., Ashland Co. Medical Society..Hayesville, 1874
Kerns, J. F., Walpole, E. O. M. S.....Bellaire, 1892
Keycraft, Albert J.....Fostoria, 1898

Kiely, W. E., Academy of Medicine.....Cincinnati, 1892
KINSMAN, D. N., Academy of Medicine.....Columbus, 1864
Kimmell, J. A., Hancock Co. Medical Society.....Findlay, 1892
King, John I., Belmont Co. Medical Society.. .....Martel, 1884
King, J. R., Academy of Medicine.....Cincinnati, 1892
Kirkley, Cyrus A., Toledo Medical Ass'n.....Toledo, 1874
Kitchen, Francis A., Toledo Medical Ass'n.....Toledo, 1892
Kline, P. J., Hempstead Academy of Medicine...Portsmouth, 1895
Knowlton, W. A., Cleveland Medical Society.....Cleveland, 1892
Koehler, Max, Academy of Medicine.....Cincinnati, 1893
Kofron, Jos. V., Cleveland Medical Society.. ... Cleveland, 1898
Kolb, Matthew G., Cleveland Medical Society....Cleveland, 1892
Krause, B., Cuyahoga Co. Medical Society.....Cleveland, 1880
Krause, L. S., Montgomery Co. Medical Soc..W. Carrollton, 1892
Krieger, Gustave L.....Madisonville, 1884
Krouse, Louis J., Academy of Medicine.....Cincinnati, 1892
Landman, Otto, Toledo Medical Ass'n.....Toledo, 1892
Langdon, F. W., Academy of Medicine.....Cincinnati, 1892
LANDON, C. P., Central Ohio Medical Soc.....Columbus, 1851
Larimore, F. C., N. C. O. M. S.....Mt. Vernon, 1871
Lash, Josiah W., Ross Co. Medical Society.....Chillicothe, 1879
Lathrop, Arthur B., N. W. O. M. A.....Swanton, 1887
Lawless, James T., Toledo Medical Ass'n.....Toledo, 1887
Lawrence, F. F., Academy of Medicine.....Columbus, 1888
Lawrence, J. C., Academy of Medicine.....Columbus, 1895
Leach, Robert.....Mt. Sterling, 1898
Leach, Sherman.....Mt. Sterling, 1888
Leahy, Maurice .....Tiffin, 1891
Lee, James F.....Mt. Vernon, 1898
Lee, J. L., N. E. O. M. A.....Akron, 1892
Lehman, C. W.,Preble Co. Medical Society.....Eaton, 1895
Leick, G. F., Cleveland Medical Society.....Cleveland, 1892
Lenhart, Charles M.....Zanesville, 1894
Leonard, E. L.....Democracy, 1897
LEONARD, B. B., N. O. M. A.....West Liberty, 1854
Leslie, J. M., Ross Co. Medical Society.....Chillicothe, 1878
Lerch, A. V.....Pleasantville, 1898
Lewis, Robt. C. M.....Centerburg, 1898
Lewis, W. C., Fairfield Co.....Rushville, 1869
Lichliter, David C., Montgomery Co. Med. Soc....Dayton, 1892
Lightner, S. B., Clinton Co. Medical Soc.....Sabina, 1888
Lincoln, William, Cleveland Medical Society....Cleveland, 1896
Linden, W. E., Cleveland Medical Society.....Brooklyn, O., 1897

Lindenberger, S. M., Miami Co.....Troy, 1898
Lindsay, J. A., E. O. M. S.....Salineville, 1895
Longfellow, R. C., Academy of Medicine.....Cincinnati, 1892
Longsworth, M. J.....St. Mary's, 1897
Lorimer, Hugh F.....Fair Haven, 1898
Love, Ephraim W., Brown Co. Medical Society..Fayetteville, 1892
LOVING, STARLING, Academy of Medicine..Columbus, 1858
Lower, Wm. E., Cleveland Medical Society.....Cleveland, 1896
Lowman, J. H., Cleveland Medical Society.....Cleveland, 1877
Lowry, Jos. W., Lawrence Co. Medical Society....Ironton, 1896
Loyer, Albert E.....New Washington, 1898
Lucas, V. C., Cleveland Medical Society.....Cleveland, 1892
Lusk, S. B., Marion Co. Medical Society.....Waynesfield, 1895
Lyle, Benj. F., Academy of Medicine.....Cincinnati, 1892
LYMAN, C. N., N. E. O. M. A.....Wadsworth, 1852
McClellan, J. S., Belmont Co. Medical Soc.....Bellaire, 1894
McCLURE, JAMES, Washington Co. Med. Soc..Marietta, 1866
McClung, John C., N. W. O. M. A.....Leipsic, 1887
McCollum, E. J., N. W. O. M. A.....Tiffin, 1871
McCoy, Clem. D., N. W. O. M. A.....Kenton, 1892
McCready, L. R., Union Medical Society.....Leetonia, 1898
McCurdy, S L., Tuscarawas Co. Medical Society..Dennison, 1882
McCurdy, John, Mahoning Co. Medical Soc..Youngstown, 1870
McCullough, Jos. A.....Steubenville, 1894
McCullough, A. H., Academy of Medicine.....Mansfield, 1897
McDougal, John G., Hildreth District M. A..New Lexington, 1894
McGee, John B., Cleveland Medical Society.....Cleveland, 1880
McGavren, Geo. W., N. W. O. M. A.....Van Wert, 1892
McGavern, Samuel B.....Cadiz, 1887
McIntire, Wm., Central Ohio Medical Society..Warrensburg, 1881
McKee, Edward S., Academy of Medicine.....Cincinnati, 1886
McKinley, E., Burris N. W. O. M. A.....Vaughnsville, 1887
McKecknie, Josiah B., Clinton Co. Medical Soc..Cincinnati, 1892
McLean, J. T., Tuscarawas Co. Med. Soc..New Philadelphia, 1884
McLean, W. F., Cleveland Medical Society.....Elyria, 1897
McMurray, A. B.....Marion, 1879
McQuaide, Thos. L., Guernsey Co.....Cambridge, 1894
McVety, A. F., Lucas Co. Medical Society.....Toledo, 1895
Mackenzie, J. C., Academy of Medicine.....Cincinnati, 1892
Macready, James, Butler Co. Medical Society.....Monroe, 1885
Maerker, A. E. H., N. W. O. M. A.....Napoleon, 1892
Malsbary, Geo. E., Academy of Medicine.....Cincinnati, 1897
Marquart, Oscar M., Greene Co. Medical Soc.....Osborn, 1891

March, E. J., Stark Co. Academy.....Canton, 1898
Markley, Lee, Brown Co. Medical Society.....Georgetown, 1892
Marquis, Thos. B., N. E. O. M. A.....New Lisbon, 1892
Marris, Joseph.....Columbus Grove, 1892
Marsh, F. O., Academy of Medicine.....Cincinnati, 1892
Marshal, R. J., E. O. M. S.....East Liverpool, 1897
Marshall, G. M., Hempstead Academy of Med..Portsmouth, 1895
Marshall, W. C., Montgomery Co. M. S.....Trotwood, 1892
Martin, Jas., N. E. O. M. A.....Fredericksburg, 1892
Martin, John C., Hancock Co. Medical Society.....Findlay, 1887
Martin, Thos. C., Cleveland Medical Society. .....Cleveland, 1897
Matthias, A. C., N. W. O. M. A.....Gilboa, 1892
Mattoon, F. N., Madison Co.....Plain City, 1881
May, John B.....New Holland, 1892
Maynard, O. T., Cleveland Medical Society.....Elyria, 1892
Means, Chas. S., Columbus Academy of Medicine..Columbus, 1896
Means, W. J., Central Ohio Medical Society.....Columbus, 1892
Melick, Wm. A., Muskingum Co. Med. Soc.....Zanesville, 1892
Merriman, D. J.....Painesville, 1884
Merriam, E. D., Ashtabula Co. Medical Society...Conneaut, 1884
Merz, Chas. H., Erie Co. Medical Society.....Sandusky, 1891
Messenger, A. C., Greene Co. Medical Society.....Xenia, 1896
Metzler, Abraham S., Holmes Co. Medical Society....Baltic, 1874
Mills, J. T., Central Ohio Medical Society.....Jersey, 1878
Miller, A. T., Tuscarawas Co. Medical Society..Shanesville, 1890
Miller, Delbert J., Union Co. Medical Society....N. Benton, 1892
Miller, John F., Shelby Co. Medical Society..Port Jefferson, 1892
Miller, N. C.....Fostoria, 1898
Miller, T. Clarke, N. E. O. M. A.....Massillon, 1893
Milliken, B. L., Cleveland Medical Society.....Cleveland, 1885
Milliken, Dan., Butler Co. Medical Society.....Hamilton, 1879
Mills, C. H., N. W. O. M. S.....Toledo, 1888
Mills, Charles B.....Marysville, 1898
Mitchell, E. W., Academy of Medicine.....Cincinnati, 1892
Mitchell, Geo., Academy of Medicine.....Mansfield, 1897
Moody, Price, Morgan Co.....Triadelphia, 1898
Moody, Milo M., Union Co. Medical Soc..Chatham Centre, 1892
Moore, C. A.....Cambridge, 1894
Moore, D. L., Academy of Medicine.....Columbus, 1895
Moore, H. M. W., Academy of Medicine.....Columbus, 1894
Moore, Lyman G., Trumbull Co. Medical Society..Kinsman, 1878
Morgan, J. F., Hempstead Academy of Medicine....Jackson, 1895
Morgan, R. J., N. W. O. M. A.....Van Wert, 1895

Morehouse, G. W.....Sparta, 1890
Morris, Joseph, N. W. O. M. A.....Columbus Grove, 1879
Mory, J. J.....St. Henry's, 1871
Mosgrove, J. M., Champaign Co. Medical Society..Urbana, 1884
MOUNTS, J. L., Warren Co. Medical Society....Morrow, 1860
Murbach, Andrew J., N. W. O. M. A.....Archbald, 1874
Murphy, John A., Academy of Medicine.....Cincinnati, 1872
Murphy, John W., Academy of Medicine.....Cincinnati, 1892
Murray, Langdon S., N. E. O. M. A.....Medina, 1870
Myers, Noah, Clarke Co. Medical Society.....Springfield, 1892
Myers, I. A., N. C. O. M. S.....Shelby, 1892
Myers, J. E., Clarke Co. Medical Society.....Springfield, 1892
Nash, E. King, Summit Co.....Montrose, 1876
Nash, W. H. H., Columbus Academy.....Columbus, 1898
Neil, Alexander.....Columbus, 1868
Nelson, J. W., Clarke Co. Medical Society.....Springfield, 1892
Newton, C. W.....Toledo, 1895
Niles, L. E.....Springfield, 1896
Noble, N. T.....St. Mary's, 1892
Noble, Herbert E., N. W. O. M. A.....Stony Ridge, 1892
Noble, Chas. D.....Oberlin, 1893
Norris, Thos. B., Franklin Co.....Alton, 1882
North, John, Toledo Medical Ass'n.....Toledo, 1891
Norton, F. B., Cuyahoga Co. Medical Society....Cleveland, 1892
Noyes, H. J., Hildreth District Med. Ass'n..McConnellsville, 1888
Nungesser, J. J., Cleveland Medical Society.....Cleveland, 1895
Obitz, N.....Columbus, 1895
Oglesbee, Wm. E., Warren Co. Medical Soc..Waynesville, 1892
Ohlmacher, A. P., Cleveland Medical Society.....Gallipolis, 1895
Oliver, J. C., Academy of Medicine.....Cincinnati, 1892
Olmstead, D. S., Holmes Co. Medical Society..Millersburg, 1892
Oster, L. W., Cleveland Medical Society.....Cleveland, 1892
Overly, John E., C. O. M. S.....Columbus, 1888
Palmer, Chauncey D., Academy of Medicine.....Cincinnati, 1871
Parry, John R., Belmont Co.....Woodsfield, 1898
PATTERSON, A. V.....Mansfield, 1861
Patrick, Nathan E., Muskingum Co., Med. Soc..Zanesville, 1894
Patrick, O. H.....Ada, 1895
PEARCE, ENOCH.....Steubenville, 1859
Pennell, W. W.....Frederickstown, 1884
Perkins, D. S., Cleveland Medical Society.....Cleveland, 1897
Peskind, Arnold, Cleveland Medical Society.....Cleveland, 1892
Peter, Robert, Tuscarawas Co. Medical Society.....Toledo, 1891

Petitt, Richard R., Montgomery Co. Medical Soc..Dayton, 1885
Phillips, W. S., N. W. O. M. S.....Belle Centre, 1895
Piper, Wm., Belmont Co. Medical Society.....Bellaire, 1892
Platter, Herbert M., Columbus Academy.....Columbus, 1898
Plummer, Frank E.....Coalton, 1896
Pomeroy, Frank S., Cleveland Medical Society....Chardon, 1897
Porter, W. D., Academy of Medicine.....Cincinnati, 1892
Potter, S. B.....Fredericktown, 1892
Potts, Chas. N., Allen Co. Medical Society.....Colorado, 1892
Powell, Wm. S.....Defiance, 1881
Pratt, L. C.....Bellefontaine, 1895
Price, F. K., Tuscarawas Co. Medical Society.....Dennison, 1895
Probst, C. O., C. O. M. S.....Columbus, 1892
Pugh, Frank H., N. W. O. M. A.....Toledo, 1892
Pumphrey, R. J., Belmont Co. Medical Society....Massillon, 1895
Quirk, Howard W., Cleveland Medical Society....Cleveland, 1889
Quinn, Allen T., Clinton Co. Medical Society..Wilmington, 1881
Rambo, Cyrus M., Muskingum Co. Medical Soc..Zanesville, 1894
Ranchous, Walter E. N.....Columbus, 1898
Rank, W. C.....Newark, 1895
Rankin, Theodore W., Academy of Medicine.....Columbus, 1881
Ransohoff, Joseph, Academy of Medicine.....Cincinnati, 1879
Rardin, Joseph S.....Portsmouth, 1892
Ravogli, Augustus, Academy of Medicine.....Cincinnati, 1892
Ray, J. B., Pike Co. Medical Society.....Omega, 1896
Ray, James B., Hempstead Med. Acad.. .....Portsmouth, 1898
Ray, J. H., S. O. A. of M.....Coalton, 1895
Rea, E. H., E. O. M. S.....Startle, 1897
REAMY, THAD A., Academy of Medicine.....Cincinnati, 1855
Redrow, I., Batavia Co. Medical Society.....Williamsburg, 1895
Reed, Calvin H., Toledo Medical Ass'n.....Toledo, 1873
Reed, T. J.....Massillon, 1881
Reed, Chas. A. L., Academy of Medicine.....Cincinnati, 1881
Reemelin, R. H., Academy of Medicine.....Cincinnati, 1892
REEVE, J. C., Montgomery Co. Medical Society..Dayton, 1861
Reeve, J. C., Jr., Montgomery Co. Medical Society..Dayton, 1892
Reif, Chas. F.....Fremont, 1892
Reinhart, James C., Toledo Medical Ass'n.....Toledo, 1887
Reynolds, R. D.....Cleveland, 1897
Rheinfrank, J. H., N. W. O. M. A.....Perrysburg, 1886
Rheinfrank, W. H.....Perrysburg, 1895
Rhu, August, Marion Co. Medical Society.....Marion, 1886
Richards, A., Perry Co. Medical Society....New Lexington, 1895

Richardson, Alonzo B., Academy of Medicine....Columbus, 1891
Ricketts, Edwin, Academy of Medicine.....Cincinnati, 1891
Ridgeway, N. B., N. C. M. S.....Galion, 1878
Riggs, J. M.....Bryan, 1873
Robb, Hunter, Cleveland Medical Society.....Cleveland, 1897
Roberds, T. W., Highland Co. Medical Society.....Bell, 1892
Rodebaugh, Henry A.....Marysville, 1890
Rodgers, J. H.....Louisville, 1889
Rogers, H. W., Cleveland Medical Society.....Cleveland, 1892
Rogers, W. K., Academy of Medicine.....Columbus, 1895
ROGERS, J. H., Clarke Co. Medical Society....Springfield, 1859
Romspert, J. A., Montgomery Co. Med. S..Dayton Asylum, 1892
Root, H. A., Toledo Medical Ass'n.....Toledo, 1892
Rosenwasser, M., Cleveland Medical Society.....Cleveland, 1880
Rosengrant, Thos. S.....Batesville, 1894
Roulet, Chas., Toledo Medical Ass'n.....Toledo, 1892
Rouse, Wm. L., Green Co. Medical Soc.....Paintersville, 1896
Row, Geo. T., Pickaway Co. Medical Society.....Circleville, 1881
Rudy, A. S., Allen Co. Medical Society.....Lima, 1892
Ruess, Henry A., N. C. O. M. S.....Mansfield, 1892
Russell, E. S., Tuscarawas Co. Medical Society..Tuscarawas, 1880
Russell, Geo. C., Cuyahoga Co. Medical Society..Cleveland, 1892
Russell, John E., N. C. O. M. S.....Mt. Vernon, 1897
Rutter, H. C.....Gallipolis, 1897
Sabin, Thos. M., Trumbull Co. Medical Society....Warren, 1893
Sager, Jos., N. W. O. M. A.....Celina, 1882
Sager, B. E., Cleveland Medical Society.....Cleveland, 1897
Sampson, G. W.....Upper Sandusky, 1895
Santee, Leon B., Stark Co. Medical Society....Marlborough, 1885
Sattler, Robert, Academy of Medicine.....Cincinnati, 1872
Sawyer, J. P., Cleveland Medical Society.....Cleveland, 1892
Scatterday, W. F.....Columbus, 1895
Schnetzler, H. Marcus, Toledo Medical Ass'n.....Toledo, 1874
Schwab, Louis, Academy of Medicine.....Cincinnati, 1892
Schwab, Emanuel, Academy of Medicine.....Cincinnati, 1892
Schutzbach, J. C., Tuscarawas Co. Medical Soc..Strasburg, 1892
Schooley, Lindley.....Belmont, 1894
Schueller, J. B., C. O. M. S.....Columbus, 1869
Scott, B. B., Knox Co. Medical Society.....Mt. Vernon, 1892
Scott, N. Stone, Cleveland Medical Society.....Cleveland, 1892
Scott, Wm. Alfred, Fulton Co.....Swanton, 1878
Scott, X. C., N. E. O. M. A.....Cleveland, 1874
SCOVILLE, S. S., Warren Co. Medical Society....Lebanon, 1859

Sears, O. T., Erie Co. Medical Society.....Put-in-Bay, 1892
Seeley, W. W., Academy of Medicine.....Cincinnati, 1871
Sittel, Theo., Academy of Medicine.....Cincinnati, 1892
Sewell, S. G., Greene Co. Medical Society...New Burlington, 1892
Shaller, John M., Academy of Medicine.....Cincinnati, 1892
Shalliott, Peter, Tuscarawas Co. Medical Soc..Winesburg, 1891
Sharp, Amos W., C. O. M. S.....Columbus, 1892
Sharp, B. M., Shelby Co. Medical Society.....Sidney, 1885
Shaw, Wm. E., Academy of Medicine.....Cincinnati, 1892
Shea, Daniel P., Wayne Co. Medical Society.Fredericksburg, 1897
Sheldon, S. B., Brown Co. Medical Society.....Five Mile, 1882
Sherman, H. G., Cleveland Medical Society.....Cleveland, 1892
Shields, E. H., Academy of Medicine.....Cincinnati, 1895
Silver, D. R., Shelby Co. Medical Society.....Sidney, 1870
SINNETT, E., Licking Co. Medical Society.....Granville, 1850
Sipher, J. N., Cleveland Medical Society.....Cleveland, 1892
Skeel, R. E., Cleveland Medical Society.....Cleveland, 1892
Slocum, Chas. E., N. W. O. M. A.....Defiance, 1874
Smith, D. M.....Newark, 1895
Smith, Wm. G., Portage Co. Medical Society.....Ravenna, 1885
Smith, H. H.....Lexington, 1892
Smith, J. M., Tuscarawas Co. Med. Soc..New Philadelphia, 1884
Smith, Chas. N., Toledo Medical Ass'n.....Toledo, 1887
Smith, D. B., Cleveland Medical Society.....Cleveland, 1892
Smith, C. W., Cleveland Medical Society.....Cleveland, 1897
Smith, Frederick K., Cuyahoga Co. Medical Soc..Cleveland, 1897
Snodgrass, Jessie, N. W. O. M. A.....Kenton, 1887
Snyder, C.....London, 1895
SNYDER, D. J., Harrison Co. Medical Society.....Scio, 1850
Snyder, S. P.....New Bedford, 1882
Snyder, Walter H., Toledo Medical Ass'n.....Toledo, 1896
Souder, R. L., N. W. O. M. A.....Nevada, 1892
Souders, Samuel, Montgomery Co. Medical Society....Dean, 1879
Southard, John Q.....Marysville, 1882
Speidel, C. G. E., Academy of Medicine.....Cincinnati, 1892
Spencer, E. R., N. E. O. M. A.....Doylestown, 1885
Spenzer, John G., Cleveland Medical Society.....Cleveland, 1896
Spurney, A. F., Cleveland Medical Society.....Cleveland, 1897
Stanton, Byron, Academy of Medicine.....Cincinnati, 1892
Straight, Howard S., Cleveland Medical Society..Cleveland, 1892
STANSELL, J. A.....Forest, 1866
Stamm, M., Sandusky Co.....Fremont, 1891
Stark, Sigmar, Academy of Medicine.....Cincinnati, 1892

Stanley, E.....Sandusky, 1870
Steel, Robt. G., Seneca Co. Medical Society.....Melmore, 1897
Stein, G. S., Academy of Medicine.....Columbus, 1888
Steiner, D. W., Allen Co. Medical Society.....Lima, 1890
Stewart, John O., Greene Co. Medical Society.....Cedarville, 1892
Stewart, Wm. D., Toledo Medical Ass'n.....Toledo, 1887
Stewart, Thos. H., Trumbull Co. Medical Soc..Church Hill, 1877
Stewart, Robt. W., Academy of Medicine.....Cincinnati, 1892
Stephenson, Y., Brown Co. Medical Society....Georgetown, 1892
Stevenson, George W., Cleveland Med. Soc.....Cleveland, 1892
Stevens, E. S., Warren Co. Medical Society.....Lebanon, 1886
Stillman, F. L., Academy of Medicine.....Columbus, 1895
STILLWELL, THOS., Sandusky Co. Med. Soc..Fremont. 1857
Stinson, Chas. H.....Newark, 1894
Storey, Wm., Erie Co. Medical Society.....Castalia, 1884
Stockton, Geo., Academy of Medicine.....Columbus, 1895
STOCKSTILL, J. N., Clarke Co.....New Carlisle, 1857
Stricker, L., Academy of Medicine.....Cincinnati, 1895
Stucky, J. G., Holmes Co.....Walnut Creek, 1897
Sudhoff, Geo. F., Academy of Medicine.....Cincinnati, 1892
SWENEY, R. L.....Marion, 1859
Swisher, A. B.....Marysville, 1898
Sylvester, John E., Jackson Co.....Wellston, 1898
Sykora, J., Cleveland Medical Society.....Cleveland, 1892
Taft, Jonathan, Academy of Medicine.....Cincinnati, 1892
Taggart, H. D., Summit Co. Medical Society.....Akron, 1892
Talley, C. F.....Hyattsville, 1895
Tangeman, C. W., Academy of Medicine.....Cincinnati, 1888
Taylor, Wm. H., Academy of Medicine.....Cincinnati, 1874
Taylor, Clovis M.....Columbus, 1894
Taylor, Fred. C., Cleveand Medical Society.....Cleveland, 1897
Telfair, Geo. M., Clinton Co. Medical Society..Bloomington, 1884
Templeton, A. M., Muskingum Co. Medical Soc..Zanesville, 1892
Templeton, B. F., Muskingum Co. Medical Soc..Zanesville, 1892
Thomas, Frank W., Marion Co. Medical Society....Marion, 1884
Thompson, C. E., Champaign Co. Med. S..No. Lewisburgh, 1896
Thompson, F. E., Morrow Co. Medical Society..Marengo, 1895
Thompson, J. A., Academy of Medicine.....Cincinnati, 1892
Thompson, S. R., Tuscarawas Co. Medical Soc..Uhrichsville, 1892
Thompson, W. E., ...St. Clairsville, 1897
Thorn, S. S., Toledo Medical Ass'n.....Toledo, 1873
Thorner, Max., Academy of Medicine.....Cincinnati, 1892
Thrasher, A. B., Academy of Medicine.....Cincinnati, 1876

Tichenor, E. J., Warren Co. Medical Society.....Lebanon, 1869
Timberman, Andrew, Columbus Academy.....Columbus, 1898
Titlow, Benatta D., Clarke Co. Medical Society..Springfield, 1892
Tobey, Henry A., Toledo Medical Ass'n.....Toledo, 1878
Todd, Fred. A., Toledo Medical Ass'n.....Toledo, 1892
Todd, J. H., Wayne Co. Medical Society.....Wooster, 1892
Towslee, Lillian G., Cleveland Medical Soc.....Cleveland, 1897
Tracy, Jas. L., Toledo Medical Ass'n.....Toledo, 1892
Trimble, C. E., Crawford Co. Medical Society.....Crestline, 1892
Trimble, R. T., Clinton Co. Medical Society.....New Vienna, 1881
Trout, J. Frances.....Lancaster, 1895
Trush, J., Academy of Medicine.....Cincinnati, 1892
Tuckerman, L. B.,Cleveland Medical Society.....Cleveland, 1891
Tydings, O., Piqua Society Clinical Medicine.....Piqua, 1892
Uhler, H. L., Marion Co. Medical Society.....Marion, 1895
Upson, Henry S., Cleveland Medical Society.....Cleveland, 1888
Upson, Geo. D., Cleveland Medical Society.....Cleveland, 1897
Vail, D. T., Academy of Medicine.....Cincinnati, 1892
VANDERVOORT, J. W., Warren Co. M. S..Harveysburg, 1864
Van Pelt, Chas. L., Toledo Medical Ass'n.....Toledo, 1887
Van Nette, Wesley, Crawford Co. Medical Society..Poplar, 1892
VANNATA, E., Muskingum Co.....Fultonham, 1855
Vigor, F. A., Fayette Co. Medical Society.....New Dover, 1884
Vorhes, B. C.....Lee, 1895
Voltz, Earnest C.....Chili, 1898
Vorhies, Elmer E.....Cambridge, 1894
Wagner, Henry P., N. W. O. M. A.....Delphos, 1892
Wagenhals, F. W., Columbus Medical Society....Columbus, 1885
Walker, Alonzo B., Union Medical Society.....Canton, 1882
Wall, J. J., N. E. O. M. S.....Mallet Creek, 1897
Wallace, A. H.....Avondale, 1898
Ward, Wadsworth A., Ashtabula Co. Medical Soc..Conneaut, 1880
Warner, Frank, Academy of Medicine.....Columbus, 1884
Warner, C. J., N. C. O. M. S.....Congress, 1892
Wardlow, Yeatman .....Columbus, 1897
Ward, Clarence S., Trumbull Co. Medical Society..Warren, 1875
Waters, Geo. M., Columbus Academy of Med....Columbus, 1896
Watson, G. N., Cleveland Medical Society.....Cleveland, 1892
Watkins, C. D.....Etna, 1898
WEAVER, J. M., Montgomery Co. Medical Soc....Dayton, 1865
Weber, Wm. C., Cleveland Medical Society.....Cleveland, 1889
Webster, J. V., Belmont Co. Medical Society.....Flushing, 1890
Weed, Theo. A.....Cleveland, 1880

Welch, Absalom J., Fayette Co. Medical Soc..Mt. Sterling, 1890
Wenner, R. J., Cleveland Medical Society.....Cleveland, 1896
Wenning, W. H., Academy of Medicine.....Cincinnati, 1892
West, T. J., N. W. O. M. A.....Tiffin, 1875
West, J. P., Belmont Co. Medical Society.....Bellaire, 1892
Whelan, Ray E., Mahoning Co. Medical Soc..Youngstown, 1897
Whittaker, J. F., Jefferson Co. Medical Soc..Bloomingdale, 1892
Whitaker, H. W., C. O. M. S.....Columbus, 1895
Whittaker, John T., Academy of Medicine.....Cincinnati, 1871
White, Wilford, Cleveland Medical Society.....Ravenna, 1897
Whitmer, J. E.....Millersburg, 1892
White, G. M., Academy of Medicine.....Columbus, 1888
Wilcox, S. S., Academy of Medicine.....Columbus, 1895
Wilson, D. C.....Ironton, 1872
Wilson, E. J.....Columbus, 1895
Wilson, J. L., Highland Co. Medical Society.....Greenfield, 1871
Willson, C. H., Pike Co. Medical Society.....Idaho, 1895
WILLSON, WM. H., Adams Co.....Greenfield, 1865
Wilson, Milo.....Gilboa, 1898
Williams, Brady O., E. O. M. S.....Martin's Ferry, 1891
Williams, W. E., Hempstead Academy of Medicine..Jackson, 1895
Willard, G. P., N. W. O. M. A.....Tiffin, 1875
Williamson, A. M., Montgomery Co. Med. Soc.....Dayton, 1892
Williams T. B., Cleveland Medical Society.....Cleveland, 1886
Winders, Frank, N. W. O. M. S.....Columbus, 1896
Wirth, R., Academy of Medicine.....Columbus, 1886
Wirt, Wm. E., Cleveland Medical Society.....U. S. Navy, 1891
Wiseman, Osbourne M., Muskingum Co. M. S...Zanesville, 1894
Withrow, J. M., Academy of Medicine.....Cincinnati, 1892
Wolfe, A. C., Academy of Medicine.....Columbus, 1896
Wood, John S.....Cleveland, Collinwood, 1880
Wood, W. H., Jefferson Co. Medical Society.....Smithfield, 1892
WOODS, JOS. T., Toledo Medical Association.....Toledo, 1862
Woods, Elizabeth, Toledo Medical Ass'n.....Toledo, 1892
Woodruff, E. W.....Columbus, 1895
WOODRUFF, L., C. O. M. S.....Alton, 1867
Woodworth, W. H.....Delaware, 1895
Wren, Wm. G.....Springfield, 1898
Wright, S. St. J., Summit Co. Medical Society....Tallmadge, 1880
Wright, J. A., N. W. O. M. A.....Toledo, 1892
Wright, Thos M., Miami Co. Medical Society.....Troy, 1891
Wright, James H.....New Lexington, 1894
Wright, John W.....Columbus, 1885

Wylie, J. L., Brown Co. Medical Society.....Ripley, 1872
Yarnall, F. H., Hildreth Dist. Med. Society..W. Lafayette, 1892
Yingling, G. S., N. W. O. M. A.....Tiffin, 1892
Yocum, L. A., Wayne Co. Medical Society.....Wooster, 1897
Young, D. Howard, Erie Co. Medical Society.....Chicago, 1892
Zenner, Phillip, Academy of Medicine.....Cincinnati, 1882
Zinke, E. G., Academy of Medicine.....Cincinnati, 1892
Zimmerman, H. A.....Youngstown, 1892
Zopfi, W. J., Hancock Co. Medical Society.....Findlay, 1891

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Patrick, O. H.
Akron—
Boyd, James P.
Cleaver, J. V.
Conn, Eli.
Jacobs, Harold H.
Jacobs, W. C.
Lee, J. L.
Taggart, H. D.
Alliance—
Hoover, Collins M.
Alton—
Norris, Thos. B.
Woodruff, L.
Apple Creek—
Jamison, J. R.
Archbald—
Murbach, Andrew J.
Arnheim—
Kautz, J. W.
Ashland—
Cowan, F.
Ashtabula—
Battles, Mary M.
Case, Freeman D.
Flower, W. R.
Athens—
Dunlap, C. O.
Avondale—
Wallace, A. H.
Baltic—
Barton, R. S.
Metzler, Abraham S.
Barnesville—
Ely, J. S.
Judkins, Jas. A.
Batesville—
Rosengrant, Thos. S.
Beaver—
Brown, E. O. S.
Bell—
Roberds, T. W.
Bellaire—
Boone, D. W.
Huston, W. O.
Kerns, J. F.
McClellan, J. S.
Piper, Wm.
West, J. P.
Belle Centre—
Phillips, W. S.
Bellefontaine—
FULLER, S. W.
Hamer, W. W.
Pratt, L. C.
Belmont—
Schooley, Lindley.
Benton—
Carson, Frank D.
Beverly—
Adair, Samuel G.
Bloomingburg—
Holdren, G. W.
Keller, B. T.
Bloomingdale—
Whittaker, J. F.
Bloomington—
Telfair, Geo. M.

Bridgeport—
Howells, James Owen.
South Brooklyn—
Linden, W. E.
Bryan—
Riggs, J. M.
Bucyrus—
Bland, J.
Chesney, John A.
Duncan, A. M.
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Kemp, Lucia.
Burbank—
Denman, Wm. C.
Cadiz—
McGavren, Samuel B.
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Bradford, W. N.
McQuaide, Thomas L.
Moore, C. A.
Vorhies, Elmer B.
Canal Dover—
Brannan, T. H.
Canton—
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Walker, Alonzo B.
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Green, Henry S.
Carey—
Brayton, Asa.
Carlisle—
Flemming, J. C.
Castalia—
Storey, Wm.
Cedarville—
Stewart, John O.
Celina—
Sager, Jos.
Centerburg—
Lewis, R. C. M.
Chardon—
Pomeroy, Frank S.
Chatham Centre—
Moody, Milo M.
Chicago—
Young, D. Howard.
Chili—
Voltz, E. C.
Chillicothe—
Barnes, T. S.
Cole, A. P.
Hall, Willard A.
Hughey, J. W.
Lash, Josiah W.
Leslie, J. M.
Church Hill—
Stewart, Thomas H.
Cincinnati—
Abbott, C. N.
Allen, Geo. N.
Allen, S. E.
Armstrong, C. L.
Ayers, S. C.
Bonifield, C. L.
Brady, M. B.
Brent, C. P.
Brown, H. M.
Brohl, Gust.
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Carson, Archibald J.
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Dandridge, N. Pendleton.
DeCourey, W. E.
Dunham, W. H.
Eichberg, Jos.
Everts, Orpheus.
Fels, Geo. W.
Fisher, P.
Fitzpatrick, T. V.
Fletcher, Mordecai H.
Foertmeyer, C. H.
Fogel, L. J.
Forcheimer, F.
French, Jas. M.
Goode, B. P.
Gores, F. C.
Grimm, Adolph.
Hall, Rufus B.
Hendley, F. W.
Hillkowitz, Wm.
Hinckley, H. D.
Hoeltge, A. E.
Holmes, C. R.
Hoppe, H. H.

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Hottendorf, Louis P.
Jones, Geo. E.
Joseph, Leopold.
Judkins, Wm.
Judkins, C. P.
Junkerman, Geo. S.
Kammann, Albert A.
Keck, Peter A.
Kiely, W. E.
King, J. R.
Koehler, Max.
Krouse, Louis J.
Langdon, F. W.
Longfellow, R. C.
Lyle, Benj. F.
McKee, Edward S.
McKeenie, Josiah B.
Mackenzie, J. C.
Malsbary, Geo. E.
Marsh, F. O.
Mitchell, E. W.
Murphy, John A.
Murphy, John W.
Oliver, J. C.
Palmer, Chauncey D.
Porter, W. D.
Ransohoff, Joseph.
Ravogli, Augustus.
REAMY, THAD. A.
Reed, Chas. A. L.
Reemelin, R. H.
Ricketts, Edwin.
Sattler, Robert.
Schwab, Louis.
Schwab, Emmanuel.
Seeley, W. W.
Sittel, Theo.
Shaw, Wm. E.
Shaller, John M.
Shields, E. H.
Speidel, C. G. E.
Stanton, Byron.
Stark, Sigmar.
Stewart, Robert W.
Stricker, L.
Taft, Jonathan.
Tangeman, C. W.
Taylor, Wm. H.
Thompson, J. A.
Thorner, Max.
Thrasher, A. B.
Trush, J.

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Wenning, W. H.
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Withrow, J. M.
Zenner, Phillip.
Zinke, E. G.

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Heffner, G. W.
Holman, A. W.
Row, Geo. T.

Clayton—
Hous, Geo. W.

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Aldrich, Chas. J.
Allen, Dudley P.
Baker, A. R.
Belt, John H.
Brashear, B. B.
Brockett, A. J.
Bruner, Wm. E.
Bunts, Frank E.
Campbell, Oscar B.
Chadwick, Leroy S.
Clapp, Harold T.
Clark, Frank S.
Coates, B. O.
Cook, J. E.
Corlett, Wm. T.
Crile, Geo. W.
Cushing, Edward F.
CUSHING, H. K.
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Erwin, J. J.
Farnsworth, G. B.
Feil, G. R.
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Fraser, J. M.
Goetz, F. E.
Hamann, C. A.
Hanson, D. S.
Hawley, Edwin P.
Herrick, H. J.
Herrick, H. B.
Hobson, J. F.
Holliday, W. W.
Holliday, Benj. W.
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Leick, G. F.
Lincoln, William.
Lower, Wm. E.
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Peskind, Arnold.
Quirk, Howard W.
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Robb, Hunter.
Rogers, H. W.
Rosenwasser, M.
Russell, Geo. C.
Sager, B. E.
Sawyer, J. P.
Scott, N. Stone.
Scott, X. C.
Sherman, H. G.
Sipher, J. N.
Skeel, R. E.
Smith, D. B.
Smith, C. W.
Smith, Frederick K.
Spenzer, John G.
Spurney, A. F.
Straight, Howard S.
Stevenson, George W.
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Taylor, Fred. C.
Towslee, Lillian G.
Tuckerman, L. B.
Upson, Henry S.
Upson, Geo. D.
Watson, G. N.
Weber, Wm. C.
Weed, Theo. A.

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Williams, T. B.
Wirt, Wm. E.
Wood, John S.

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Plummer, Frank E.
Ray, J. H.

Colorado—
Potts, Chas. N.

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Baldwin, J. F.
Barnes, J. W.
Barnhill, James U.
Bethauser, C. M.
Blackburn, M. E.
Blake, F. W.
Bleile, A. M.
Bowen, A. H.
Brown, J. E.
Butler, Geo. W.
Carpenter, E. G.
Clark, C. F.
Clouse, Geo. M.
Cole, Wm. N.
Coleman, N. R.
Cooper, Albert.
Cooperrider, C. A.
Cowell, W. M.
Deuschle, W. D.
Dick, W. L.
Dixon, M. F.
Dunham, J. M.
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Evans, A. E.
Fraker, H. C.
Fullerton, Erskine B.
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Gilliam, D. Tod.
Guerin, Z. F.
Hamilton, W. D.
Hamilton, C. S.
Harper, E. A.
Hendrixson, Hugh.
Heston, J. Z.
Homes, W. W.
Hoover, Thos. C.
Johnston, Alice M.
JONES, T. W.
Kahn, L.
KINSMAN, D. N.
LANDON, C. P.

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Lawrence, J. C.
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Marshall, G. M.
Means, Chas. S.
Means, W. J.
Moore, D. L.
Moore, H. M. W.
Nash, W. H. H.
Neil, Alexander.
Obitz, N.
Overly, John E.
Platter, H. M.
Probst, C. O.
Ranchous, W. L. N.
Rankin, Theodore W.
Richardson, Alonzo B.
Rogers, W. K.
Scatterday, W. F.
Schueller, J. B.
Sharp, Amos W.
Stein, G. S.
Stillman, F. L.
Stockton, George.
Taylor, Clovis M.
Timberman, A.
Wagenhals, F. W.
Warner, Frank.
Wardlow, Yeatman.
Waters, Geo. M.
Whitaker, H. W.
White, G. M.
Wilcox, S. S.
Wilson, E. J.
Winders, Frank.
Wirth, R.
Wolfe, A. C.
Woodruff, E. W.
Wright, John W.

Columbus Grove—
Morris, Joseph.
Morris, Frank.

Congress—
Warner, C. J.

Conneaut—
Merriam, E. D.
Ward, Wadsworth A.

Convoy—
Hall, E. V.

Cope—
Cope, E. C.

Copley—
Chapman, Bryon.

Corning—
Callinan, D. F.
Halcomb, C. B.

Crestline—
Trimble, C. E.

Cuyahoga Falls—
Hough, Wayland S.
Howard, A. B.

Dalton—
Haney, Josiah C.

Dupont—
Bird, Edw. H.
Hixon, M. M.

Deavertown—
Folk, Peter.

Defiance—
Potts, Chas. M.
Slocum, Chas. E.

Dean—
Sanders, Samuel.

Delaware—
Chidester, C. W.
Fowler, Silas W.
Hughes, D. E.
HYATT, E. H.
Woodworth, W. H.

Delphos—
Wagner, Henry P.

Democracy—
Leonard, E. L.

Dennison—
Price, F. K.

Deshler—
Gehritt, T. M.

Dayton—
Adams, P. N.
Barker, F. D.
Barrere, D. M.
Beck, John S.
Bonner, C. A.
Bonner, Horace.
Conklin, W. J.
Corbin, Lee.
Dolina, J. F.
Ellis, Samuel B.
Evans, Geo. B.
Goodhue, Geo.
Gray, Francis C.

Dayton—
Greene, D. W.
Humphrey, C. H.
Jenner, Henry G.
Jennings, Ellis.
Jewett, H. S.
Lichliter, David C.
Petitt, Richard R.
REEVE, J. C.
Reeve, J. C., Jr.
WEAVER, J. M.
Williamson, A. M.

Dayton Asylum—
Romspert, J. A.

Dresden—
Dorsey, Jos. F.

Duncan's Falls—

East Liverpool—
Calhoun, W. M.
Hobbs, Wilbert A.
Ikirt, G. P.
Marshal, R. J.

East Toledo—
Hathaway, Harrison.

Eaton—
Lehman, C. W.

Eldorado—
Davisson, J. Alexander.

Elgin—
Clay, W. P.

Elyria—
McLean, W. F.
Maynard, O. T.

Etna—
Watkins, C. D.

Fair Haven—
Lorimer, H. F.

Fayette—
Backus, L. C.

Fayetteville—
Love, Ephriam W.

Findlay—
Baker, J. P.
Entrekin, F. W.
Hurd, A.
Kimmell, J. A.
Martin, John C.
Zopfi, W. J.

Five Mile—
Sheldon, S. B.

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Hobson, John A.
Webster, J. V.

Forest—
STAUSELL, J. A.

Fostoria—
Hoege, G. L.
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Miller, N. C.

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Death, H. J.
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Martin, Jas.
Shea, Daniel P.

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Potter, S. B.

Fremont—
BRINKERHOFF, D. H.
Hillbish, Fred. S.
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Stamm, M.
STILLWELL, THOS.

Fulda—
Albers, J. G.

Fultonham—
Axline, Chas. Z.
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Alcorn, E. G.
Alcorn, John B.
Ohlmacher, A. P.
Rutter, H. C.

Geneva—
S. S. Burrows.

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Church, Walter F.
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Mathias, A. C.
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WILLSON, WM. H.
Greenford—
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Rheinfrank, W. H.

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St. Henry's—
Mory, J. J.
St. Mary's—
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Startle—
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Strasburg—
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McCollough, Jos. A.
PEARCE, ENOCH.

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Yingling, G. S.
Tippecanoe City—
Hartman, S. D.
Tiro—
Guiss, W. E.
Toledo—
Becker, Bernard.
Beckwith, Seth W.
Bessey, J. Mortimer.
Bodman, Lewis H.
Bond, John W.
Brand, Walter W.
Brigham, O. S.
Chapman, Wm. C.
Coldham, Wm. W.
Collamore, Geo. A.
Cosgrove, Thos.
Craver, S. Belle.
Curry, John H.
DeVilbiss, Allen.
Donnelly, James.
Duncan, James A.
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Fella, F. J.
Fisher, A. W.
Fisher, A. H.
FORBES, S. F.
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Toledo—
Kitchen, Francis A.
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Newton, C. W.
North, John.
Peter, Robert.
Pugh, Frank H.
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Reinhart, James C.
Root, H. A.
Roulet, Chas.
Schnetzler, H. Marcus.
Smith, Chas. N.
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Woods, Elizabeth.
Wright, J. A.
Toronto—
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Troy—
Lindenberger, S. M.
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Tuscarawas—
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Upper Sandusky—
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LYMAN, [illegible] N.
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Stucky, J. G.
Wapakoneta—
Getzloff, B.
Warren—
HARMON, JULIAN.
Harmon, J. D.
Sabin, Thomas M.
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Warrensburg—
McIntire, Wm.
Washington C. H.—
Boggess, E. M.
Howell, J. Morton.
Ireland, W. E.
Ireland, S. A.
Waterford—
Hayward, E. T.
Watertown—
Bohl, John, Sr.
Waterville—
Downs, Samuel.
Wauseon—
Hartman, Geo. W.
Waverly—
Andre, Orrin C.
Caldwell, John L.
Waynesfield—
Lusk, S. B.
Waynesville—
Oglesbee, Wm. E.
Webster—
Ballinger, J. B.
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Sylvester, J. E.
West Cairo—
Henderson, Geo. W.
West Carlisle—
Edwards, R. C.
West Carrollton—
Krause, L. S.
West Lafayette—
Yarnell, F. H.
West Liberty—
LEONARD, B. B.
West Milton—
Jennings, Gainor.

West Minster—
Creps, Adolphus H.
Weston—
Hill, Wm. W.
West Union—
Bunn, Jas. W.
Williamsburg—
Redrow, I.
Wilmington—
Quinn, Allen T.
Winesburg—
Shalliott, Peter.
Withamsville—
Bennett, C. A.
Woodsfield—
Parry, J. R.
Wooster—
Hunt, A. H.
Todd, J. H.
Yocum, L. A.
Worthington—
Johnson, Fred. L.
Xenia—
Brundage, L. A.
Galloway, C. M.
Galloway, W. A.
Messenger, A. C.
Youngstown—
Buechner, W. L.
Clark, Ida.
Clark, Myron S.
Cone, J. E.
McCurdy, John.
Whelan, Ray E.
Zimmerman, H. A.
Zanesville—
Brush, Edmund C.
Crider, Chas. L.
Crossland, Jeff. C.
Culbertson, Louis Rogers.
Fassig, J. M.
Haldeman, John S.
Holston, J. G. F.
Lenhart, Charles M.
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Patrick, Nathan E.
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Templeton, A. M.
Templeton, B. F.
Wiseman, Osbourne M.

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Barnes, Noble P., 611 Maryland Ave., Washington, D. C. 1894
Graham, John C., Academy of Medicine.....Denver, 1892
Goodson, John M .....Sterling, Kas.
Hill, Frank E., Clermont Co. Medical Soc..Mt. Auburn, Ky. 1892
Jackson, T. W., N. E. O. M A.....Philadelphia, Pa., 1895
Kurtz, C. E.....4460 Berkely Ave., Chicago, Ill.
Murphy, C. T..... .....New York, N. Y.
Nunnemacker, H. B.....44th and Market Sts., Philadelphia, Pa.
Reed, R. Harvey, N. C. O. M. A...Rock Springs, Wyoming, 1884
Rice, W. E..... ....Tuscola, Ill.
Spence, J. A., Wellsville Medical Society....Pittsburg, Pa., 1888
Williams, James L..... .....Indianapolis, Ind.
Woodbridge, John E., Mahoning Co. Med. Soc.Chicago, Ill., 1886

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Roberts Bartholow, M. D.....Philadelphia, Pa., 1879
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Judson Daland, M. D.....Philadelphia, Pa., 1895
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Donald Maclean, M. D.....Detroit, Mich., 1894
H. O. Marcy, M. D.....Boston, Mass., 1897
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Capt. J. E. Pilcher.....U. S. Army, 1896
Hunter Robb, M. D. (Permanent Member, 1897)..Cleveland, 1894
E. D. Safford, M. D.....Parkersburg, W. Va., 1870
N. Senn, M. D.....Chicago, 1890
J. M. Stevenson, M. D.....Pittsburgh, Pa., 1866
R. S. Sutton, M. D.....Pittsburgh, Pa., 1884
Victor C. Vaughan, M. D.....Ann Arbor, Mich., 1889

DELEGATES TO THE FIFTY-THIRD ANNUAL MEETING OF THE O. S. S.

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Dugan, J. P., Clark Co. Medical Society.....Springfield.
Heffner, Geo. W., Pickaway Co. Medical Society.....Circleville.
Gotwald, D. K., Clark County Medical Society.....Springfield.
Holman, A. W., Pickaway Co. Medical Society.....Circleville.
Irvin, S. J., Pickaway Co. Medical Society.....Circleville.
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Reed, C. R., Meigs Co. Medical Society.....Middleport.
Roush, L. F., Meigs Co. Medical Society.....New Haven, W. Va.
Snyder, D. J., Eastern Ohio Medical Ass'n.....Scio.
Titlow, B. D., Clark Co. Medical Society.....Springfield.

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Foshay, P. Max. ..... Cleveland.
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Straight, H. S. ..... Cleveland.
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Woodruff, E. W. ..... Columbus.

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Timberman, Andrew, Columbus Academy.....Columbus, 1898
Voltz, Ernest C.....Chili, 1898
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Watkins, C. D.....Etna, 1898
Wilson, Milo.....Gilboa, 1898
Wren, Wm. G.....Springfield, 1898

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Thos. F. Keller ..... Tiffin.
H. B. Gibbon ..... Tiffin.
J. S. Beck ..... Dayton.
G. O. Myers ..... Dayton.
A. F. House ..... Cleveland.
John Eakins ..... Patriot.
Ralph J. Wenner ..... Cleveland.
W. Plattfaut ..... Dayton.
P. Max Foshay ..... Cleveland.
H. A. Rodebaugh ..... Maryville.
R. Sattler ..... Cincinnati.
W. W. Pennell ..... Fredericktown.
O. S. Cox ..... Allensville.
Chas. S. Hart ..... Marietta.
C. E. Beardsley ..... Ottawa.
D. J. Snyder ..... Scio.
E. F. Wilson ..... Columbus.
O. T. Maynard ..... Elyria.
J. U. Barnhill ..... Columbus.

A. E. Evans .....Columbus.
B. O. Coates .....Cleveland.
A. B. Walker .....Canton.
C. D. Noble .....Oberlin.
J. Frank Kahler .....Quaker City.
C. A. Moore .....Cambridge.
Alex Neil ..... Columbus.
T. J. Reed .....Massillon.
T. C. Miller .....Massillon.
Frank Winders ..... Columbus.
Andrew Timberman ..... Columbus.
Z. F. Guerin .....Columbus.
L. F. Roush .....New Haven, W. Va.
C. R. Reed ..... Middleport.
C. D. Watkins .....Etna.
A. P. Ohlmacher ..... Gallipolis.
R. T. Trimble .....New Vienna.
J. C. Oliver .....Cincinnati.
A. H. Wallace .....Avondale.
R. S. Barton .....Baltic.
J. W. Hoff .....Pomeroy.
E. C. Voltz .....Chili.
Sherman Leach .....Mt. Sterling.
S. B. Lusk .....Waynesfield.
F. L. Johnson .....Worthington.
G. D. Ballard ..... Jefferson.
J. C. Snyder .....Bowling Green.
R. R. Petitt .....Dayton.
D. S. Hanson .....Cleveland.
R. L. Crooks .....Convoy.
Price Moody ..... Triadelphia.
Esther M. Tyrrell .....Canton.
S. Belle Craver .....Toledo
H. E. Whitsey .....Ashtabula.
E. J. March .....Canton.
M. J. Finley .....Mansfield.
D. E. Spahr .....Clifton.
L. H. Conley .....Gas City, Ind.
J. B. Garber .....Dunkirk, Ind.
F. L. Gage .....Delaware.
E. V. Hall .....Convoy.
D. J. Merriman .....Painesville.
W. P. Clay .....Elgin.

W. J. Conklin .....Dayton.
H. S. Jewett .....Dayton.
W. I. Ellis .....Canton.
J. D. Watterson .....Kalida.
Thos. M. Wright .....Troy.
W. W. Hamer .....Bellefontaine.
E. S. Koons .....Jacksonville.
L. B. Tuckerman .....Cleveland.
E. J. Wilson .....Columbus.
B. M. Ricketts .....Cincinnati.
W. M. Cowell .....Columbus.
J. M. Weaver .....Dayton.
W. G. Wren .....Springfield.
Enoch Pearce ..... Steubenville.
James A. Duncan .....Toledo.
J. V. Kofron .....Cleveland.
W. M. Burgess .....Portsmouth.
Ben Davis .....New Carlisle.
P. D. Shriner .....Columbus.
A. R. Baker .....Cleveland.
D. R. Silver .....Sidney.
G. B. Evans .....Dayton.
F. C. Gray .....Dayton.
A. C. Wolfe .....Columbus.
C. P. Landon .....Columbus.
F. Warner .....Columbus.
J. G. Albers .....Fulda.
P. J. Kline .....Portsmouth.
L. D. Allard .....Portsmouth.
O. Hasencamp ..... Toledo.
J. C. Haney .....Dalton.
A. V. Lyman .....Wadsworth.
J. Z. Heston .....Columbus.
E. E. Hughes .....Oak Hill.
J. A. Harper .....Wellston.
S. Shauwecker .....Shanesville.
H. A. Hare .....Philadelphia, Pa.
P. J. Baker .....Findlay.
I. A. Myers .....Shelby.
W. B. Hedges .....Delaware.
C. H. Willson .....Idaho.
S. G. Sewell .....New Burlington.
G. W. Clemson .....Thornville.

W. S. Scurlock ..... New Holland.
J. L. Slager ..... Paulding.
Charles Graefe ..... Sandusky.
F. C. Griffis ..... Mt. Gilead.
G. W. Morehouse ..... Sparta.
W. R. Thompson ..... Troy.
L. M. Lindenberger ..... Troy.
J. E. Whitmar ..... Millersburg.
W. D. Stewart ..... Toledo.
C. J. Warner ..... Wooster.
C. A. Tuch ..... Wooster.
A. J. Ruycraft ..... Fostoria.
N. C. Miller ..... Fostoria.
L. P. Howell ..... Milledgeville.
W. Hammel ..... Circleville.
Harry L. Jones ..... Columbus.
J. R. Jamison ..... Apple Creek.
M. F. Hussey ..... Sidney.
J. C. Reeve, Jr. ..... Dayton.
W. N. Bradford ..... Cambridge.
J. A. Stansell ..... Forest.
J. A. Davidson ..... Eldorado.
G. W. Wire ..... Wilmington.
C. S. Means ..... Columbus.
W. J. Means ..... Columbus.
C. M. Bethauser ..... Columbus.
J. M. Fassig ..... Zanesville.
C. L. Axline ..... Fultonham.
Charles A. Teeters ..... Jeffersonville.
W. H. Finley ..... Xenia.
J. D. Axline ..... Shawnee.
L. D. Hamilton ..... Marion.
C. E. Trimble ..... Crestline.
J. F. Fitzsimmons ..... Bucyrus.
C. F. Talley ..... Powell.
F. D. Bain ..... Kenton.
Jesse Snodgrass ..... Kenton.
W. H. Blake ..... Shadeville.
J. F. Fox ..... New Philadelphia.
F. F. Lawrence ..... Columbus.
A. C. Holland ..... Mt. Perry.
D. P. Shie ..... Fredericksburg.
J. E. Sylvester ..... Wellston.

E. G. Myers ..... Canton.
A. W. Holman ..... Circleville.
D. V. Courtright ..... Circleville.
L. Kemp ..... Bucyrus.
C. E. Slocum ..... Defiance.
C. W. Thompson ..... Roundhead.
E. W. Woodruff ..... Columbus.
J. S. Beck ..... Dayton.
J. H. Goss ..... Lancaster.
C. W. Goss ..... Lancaster.
Nettie A. Belan ..... Defiance.
Marie Simons ..... Richwood.
W. E. M. Ranchous ..... Columbus.
D. H. Young ..... Chicago.
S. F. Chaney ..... Pricetown.
D. M. Smith ..... Newark.
W. W. Brand ..... Toledo.
G. A. Hollister ..... Toledo.
J. F. Baldwin ..... Columbus.
C. C. Probst ..... Columbus.
J. Q. Southard ..... Maryville.
C. B. Holcomb ..... Corning.
C. F. Clark ..... Columbus.
Z. V. Luke ..... Belle Centre.
H. F. Lorimer ..... Fair Haven.
E. Sinnett ..... Granville.
P. A. Gordon ..... Junction City.
J. H. Wright ..... New Lexington.
P. E. Schenck ..... Columbus.
E. W. Evans ..... Columbus.
J. C. Lawrence ..... Columbus.
J. G. McDougal ..... New Lexington.
C. L. Thomas ..... Columbus.
E. S. Harper ..... Columbus.
W. H. Woodworth ..... Delaware.
C. W. Tangeman ..... Cincinnati.
E. W. Baleer ..... Clyde.
A. M. Duncan ..... Bucyrus.
J. L. Gahm ..... Jackson.
J. H. Ray ..... Coalton.
J. B. Woodworth ..... Delaware.
G. A. Collamore ..... Toledo.
L. W. Faulkner ..... St. Paris.

S. L. Herrington .....Rawson.
Yeatman Wardlow ..... Columbus.
S. S. Thorn .....Toledo.
R. M. Crane .....Marion.
O. C. Andre .....Waverly.
J. B. Ray, Jr. .....Portsmouth.
C. L. Dine .....Minster.
C. A. Hatch .....Newark.
G. F. Lower .....Port Washington.
A. J. Welch .....Mt. Sterling.
F. A. Stickney .....Kilbourn.
W. F. Crickards .....Delaware.
N. B. Ervin .....Gibsonburg.
F. G. Stueber .....Lima.
L. F. Landwick .....
W. A. Melick .....Zanesville.
D. W. Henderson .....Marysville.
Francis W. Blake .....Columbus.
W. J. Weaver .....New Albany.
W. C. Harkins .....Mifflin.
Albert Cooper ..... Columbus.
B. F. Miesse .....Chillicothe.
Dickson L. Moore .....Columbus.
John Simpkins ..... Cincinnati.
Harmon Good .....Sulphur Grove.
J. W. Irvin .....Magnetic Springs.
J. Ambrose Johnston .....Cincinnati.
Henry Wald Bettman .....Cincinnati.
L. C. Anderson .....Greenville.
H. J. Herrick .....Cleveland.
N. P. Davidson .....Hilliard.
Chas. D. Mills .....Marysville.
S. H. Sibert .....Foyburgh.
E. W. Mitchell .....Cincinnati.
S. R. McCready .....Leetonia.
C. W. Albright .....Milo.
N. W. Culbertson .....Massillon.
A. M. Hoyer .....Nashville.
J. W. McKinley .....Harrisburg.
C. C. Ross .....Columbus.
F. L. Stillman .....Columbus.
J. A. Thompson .....Cincinnati.

Total number registered, 254.

SOCIETIES AUXILIARY TO THE OHIO STATE MEDICAL SOCIETY

Allen Co. M. S.....I. F. Steiner, Lima.
Ashland Co. M. S.....R. C. Kinnaman, Ashland.
Ashtabula, Lake & Geauga Cos. M. S.....
..... Clarence E. Case, Ashtabula.
Belmont Co. M. S.....W. O. Huston, Bellaire.
Brown Co. M. S.....L. Markley, Georgetown.
Butler Co. M. S.....Aug. Schumacher, Hamilton.
Central Ohio M. S.....E. M. Hatton, Columbus.
Champaign Co. M. S.....E. W. Ludlow, Urbana.
Cincinnati Academy of Medicine.....
.....Wm. H. Crane, 20 W. Ninth St., Cincinnati.
Clarke Co. M. S.....B. D. Titlow, Springfield.
Clermont Co. M. S.....E. C. Ireton, Marathon.
Clinton Co. M. S.....E. Briggs, Wilmington.
Cleveland M. S..J. M. Ingersoll, 50 Euclid Ave., Cleveland.
Columbus Academy of Medicine, H. M. Platter, Columbus.
Crawford Co. M. S.....Lucia Kemp, Bucyrus.
Cuyahoga Co. M. S., C. C. Stuart, 1207 Pearl St., Cleveland.
Defiance Co. M. S.....J. J. Reynolds, Defiance.
Delaware Co. M. S.....J. B. Woodworth, Delaware.
Eastern Ohio Med. Assn....J. C. M. Floyd, Steubenville.
Erie Co. M. S.....A. F. Cook, Sandusky.
East Liverpool Med. Assn..W. A. Hobbs, East Liverpool.
Fayette Co. M. S.....
Gallia Co. M. S.....J. B. Alcorn, Gallipolis.
Greene Co. M. S.....B. R. McClellan, Xenia.
Hancock Co. M. S.....D. C. Hughes, Findlay.
Hempstead Memorial Academy of Medicine.....
.....M. S. Pixley, Portsmouth.
Highland Co. M. S.....Lockhart Nelson, Hillsboro.
Hildreth District Med. Assn....N. E. Patrick, Zanesville.
Holmes Co. M. S.....D. S. Olmstead, Millersburg.
Jackson Co. M. S.....O. M. Woodrow, Wellston.
Jefferson Co. M. S.....A. A. Elliott, Steubenville.
Lawrence Co. M. S.....Alfred Robinson, Ironton.
Lorain Co. M. S.....E. V. Hug, Lorain.
Lucas Co. M. S.....J. A. Wright, Toledo.
Mahoning Co. M. S.....R. E. Whelan, Youngstown.
Mansfield Academy of Medicine..J. L. Stevens, Mansfield.

Marion Co. M. S.....R. Ramroth, Marion.
Meigs Co. M. S.....D. Sisson, Middleport.
Miami Co. M. S.....W. Coleman, Troy.
Miami Valley M. S..... Con Gatch, Milford.
Montgomery Co. M. S.....Frank Fife, Dayton.
Morrow Co. M. S.....F. C. Griffis, Mt. Gilead.
Muskingum Co. M. S.....Anna M. Hill, Zanesville.
North Central Ohio M. S..J. Lillian McBride, Mansfield.
North-Western Ohio Med. Assn.....J. P. Baker, Findlay.
Perry Co. M. S.....J. G. McDougal, New Lexington.
Pickaway Co. M. S.....A. W. Holman, Circleville.
Pike Co. M. S.....O. C. Andre, Waverly.
Portage Co. M. S.....George J. Waggoner, Ravenna.
Ross Co. M. S.....F. M. Smallwood, Chillicothe.
Sandusky Co. M. S.....R. H. Rice, Fremont.
Shelby Co. M. S.....J. W. Costolo, Sidney.
Stark Co. Academy of Medicine.....
.....R. J. Pumphrey, Massillon.
Stillwater M. S.....D. W. Copeland, Somerton.
Toledo Medical Assn.....C. P. Wagar, Toledo.
Trumbull Co. M. S.....J. D. Harmon, Warren.
Tuscarawas Co. M. S.....C. U. Patterson, Urichsville.
Union Med. Assn.....F. T. Miles, Salem.
Union Med. Assn. of N. E. Ohio....J. H. Seiler, Akron.
Warren Co. M. S.....E. S. Stevens, Lebanon.
Washington Co. M. S.....J. B. McClure, Marietta.
Wayne Co. M. S.....J. D. Beer, Wooster.

List of the Members of the Local Medical Societies Auxiliary to the Ohio State Medical Society

ADAMS COUNTY MEDICAL SOCIETY

Auxiliary since 1888 Annual Meeting in June

W. K. Coleman .....President.
R. A. Stephenson .....Vice President.
James W. Bunn .....Secretary.
D. B. Kirkpatrick .....Treasurer.

MEMBERS

Bunn, James W., West Union.
Berry, J. S., Peebles.
Carboy, C. S., Winchester.
Coleman, W. K., West Union.
Connell, W. R. S., Manchester.
Gaston, E. M., Tranquility.
Guthrie, J. W., Manchester.
Kirkpatrick, D. B., No. Liberty.
Lockhart, J. M., Eckmansville.
Stephenson, R. A., Manchester.
Stevenson, Titus, North Liberty.
Sproull, O. T., Bentonville.
Wittenmeyer, J. M., West Union.

ALLEN COUNTY MEDICAL SOCIETY

Auxiliary since 1887 Annual Meeting in May

F. L. Bates .....President.
I. F. Steiner .....Secretary.
E. E. McCall.....Vice President.
F. G. Stueber.....Treasurer.

MEMBERS

Bates, F. L., Lima.
Bennett, H. C., Lima.
Bice, A. W., Lima.
Brooks, P. H., Lima.
Burton, E. G., Lima.
Collins, C. C., Lima.
Foltz, G. W., Lima.
Goebel, A. M., Lima.
Harper, W. H., Lima.
Henderson, G. W., West Cairo.
Hill, R. M. C., Herring.
Hiner, S. B., Lima.
Hover, Wm. E., Lima.
Huntley, J., Lima.
Laudick, L. F., Lima.
McCall, E. E., Lima.
Morse, B., Lima.
Mumaugh, S., Lima.
Parent, W. H., Lima.
Rudy, A. S., Lima.
Sager, N., Herring.
Steiner, D. W., Lima.
Steiner, I. F., Lima.
Stueber, F. G., Lima.
Stueber, L. J., Lima.
Terwilliger, T. R., Lima.
Vail, J. B., Lima.
Van Note, W. B., Lima.
Weadock, T. M., Lima,

ASHTABULA, LAKE AND GEAUGA MEDICAL SOCIETY

Auxiliary since 1896 — Annual Meeting in January

F. W. Upson ..... President.
A. W. Hopkins ..... 1st Vice-President.
W. R. Flower ..... 2d Vice-President.
Clarence E. Case ..... Secretary.
H. W. Dorman ..... Treasurer.

MEMBERS

Aldrich, D. B., Ashtabula.
Amidon, H. N., Painesville.
Anderson, G. S., Andover.
Baker, C. D., Conneaut.
Battles, Mary, Ashtabula.
Baxter, R. J., Conneaut.
Blakeslee, O. O., Conneaut.
Block, J. M., Montville.
Bollard, G. D., Jefferson.
Bucher, J. F., Dodgeville.
Burrows, S. S., Geneva.
Buys, Frank, Painesville.
Case, Clarence E., Ashtabula.
Case, F. D., Ashtabula.
Clark, F. R., Trumbull.
Cossitt, D. S., Conneaut.
Dickson, J. A., Ashtabula.
Dorman, H. W., Ashtabula.
Edwards, P. J., Huntsburg.
Ellsworth, W. O., Austinburg.
Fisher, F. W., Ashtabula.
Flower, W. R., Ashtabula.
Fox, C. L., Kingsville.
Gilchrist, W. L., Ashtabula.
Graham, J. M., Williamsfield.
Grover, C. T., Orwell.
Hogan, J. J., Ashtabula.
Hopkins, A. W., Ashtabula.
Houghtaling, F. M., Austinburg.
House, C. H., Painesville.
King, W. S., Ashtabula.
Leet, Wm., Conneaut.
Merriam, E. D., Conneaut.
Merriman, D. J., Painesville.
Osborn, H. M., Kellogsville.
Palmer, D. G., Geneva.
Pomeroy, O., Chardon.
Pomeroy, A. L., Windsor.
Quayle, C. H., Madison.
Robinson, O. C., Windsor.
Shaefer, J. A., Ashtabula.
Shalto, H. J., Colebrook.
Snyder, F. D., Ashtabula.
Tower, B. M., Conneaut.
Upson, F. W., Conneaut.
Warner, A. D., Burton.
Webster, G. E., Kingsville.
Weiss, W. L., Rock Creek.
Whitsey, H. E., Ashtabula.
Wilson, H., Conneaut.

BELMONT COUNTY MEDICAL SOCIETY

Auxiliary since 1887 — Annual Meeting in December

J. M. Blackford ..... President.
J. O. Howells ..... Vice-President.
W. O. Huston ..... Secretary.
G. H. Colville ..... Treasurer.
Board of Censors—J. A. Clark, J. N. Drennen, A. C. Beetham, A. J. Heinlein, J. R. Parry.

MEMBERS

Beetham, A. C., Bellaire.
Black, O. J., Bridgeport.
Blackford, J. M., Martins Ferry.
Boone, D. W., Bellaire.
Boone, J. S., Powhatan.
Calhoun, G. E., Maynard.
Clark, J. A., Glencoe.
Cole, C. C., Bridgeport.
Colville, G. H., Harrisville.
Cooper, J. W., Bellaire.
Cope, E. C., Cope.
Cope, I. G., Cope.
Diven, A. W., Martins Ferry.
Drennen, J. N., Loydsville.
Ely, J. S., Barnesville.
Gregg, S. T., Belmont.
Hawthorn, E. L., Colerain.
Heinlein, A. J., Bridgeport.
Hewetson, A. H., St. Clairsville.
Hobson, A. B., Flushing.
Hobson, J. A., Flushing.
Howells, J. O., Bridgeport.
Huston, W. O., Bellaire.
Judkins, W. L., Barnesville.
Korner, A. H., Alledonia.
Korrell, F. A., Key.
McClellan, J. S., Bellaire.
McClester, J. C., Harrisville.
Minesinger, J. L., Bellaire.
McDonald, J. W., Benwood, W. Va.
Ong, A. R., Martins Ferry.
Parry, J. R., Woodsfield.
Piersol, Joseph, Bellaire.
Piper, Wm., Bellaire.
Phillips, D. F., Morristown.
Riggs, E. N., Powhatan.
Rowles, T. H., Cambridge.
Thompson, W. E., St. Clairsville.
Webster, J. V., Flushing.
West, J. P., Bellaire.
West. S. L., St. Clairsville.
West, H. S., St. Clairsville.
Williams, B. O., Martins Ferry.
Workman, J. C., Uniontown.

BUTLER COUNTY MEDICAL SOCIETY

Auxiliary since 1852 — Annual Meeting in January

F. M. Barden ..... President.
Mark Millikin ..... Vice-President.
Aug. Schumacher ..... Secretary.
F. M. Fitton ..... Treasurer.

MEMBERS

Abbott, E. H., Summerville.
Alexander, W. S., Oxford.
Barden, F. M., Hamilton.
Brown, Walter, Hamilton.
Bundy, D. B., Middletown.
Carter, H. H., Hamilton.
Cherryholmes, W. K., Hamilton.
Cook, Geo. F., Oxford.
Dickey, T. A., Middletown.
Fitton, F. M., Hamilton.
Fitzpatrick, T. V., Cincinnati.
Francis, John, Hamilton.
Grafft, James, Trenton.
Grafft, John, Seven Mile.
Hancock, W. D., Millville.
Hermann, G. A., Hamilton.

Hill, Ed. L., Oxford.
Hinckley, H. D., Cincinnati.
Hornung, F. G., Hamilton.
Huston, Chas. N., Hamilton.
Huston, Wm. C., Hamilton.
Jacobs, M. M., Hamilton.
Long, James, Millville.
Lummis, Geo. D., Middletown.
Macready, James, Monroe.
Mallory, Henry, Hamilton.
Mayer, O. W., Hamilton.
Millikin, Dan, Hamilton.
Millikin, Mark, Hamilton.
Owsley, J. B., Jacksonburg.
Reed, C. A. L., Cincinnati.
Reed, W. S., Stockton.
Roll, J. H., Hamilton.
Scheel, J. O., Hamilton.
Schaefer, C. A., Darrtown.
Schumacher, Aug., Hamilton.
Sharkey, Thos. D., Hamilton.
Sill, E. C., Hamilton.
Skinner, G. C., Hamilton.
Smedley, A. L., Hamilton.
Smith, H. S., Middletown.
Torrence, J. E., Oxford.
Twitchell, Herbert, Hamilton.
Urmston, Wm. B., Hamilton.
Wasson, C. C., Hamilton.
Weston, A. J., Clawson.

CHAMPAIGN COUNTY MEDICAL SOCIETY

Auxiliary since 1879 — Annual Meeting in April

S. M. Mosgrove ..... President.
F. S. Thomson ..... Vice-President.
E. W. Ludlow ..... Secretary.
D. O. Brine ..... Treasurer.
J. V. Longfellow ..... Librarian.
Censors—M. L. Smith, D. R. Emmons, H. M. Pearce.

MEMBERS

Baker, B. F., St. Paris.
Brine, D. O., Urbana.
Carter, J. S., Urbana.
Clark, J. H., Mechanicsburg.
Demand, C. E., Mechanicsburg.
Emmons, D. R., No. Lewisburg.
Henderson, R., Urbana.
Hunt, H. B., St. Paris.
Leonard, B. B., West Liberty.
Longfellow, J. V., Urbana.
Ludlow, E. W., Urbana.
McLaughlin, C. M., Westville.
Mosgrove, S. M., Urbana.
Mosgrove, S. M., Urbana.
Mosgrove, W. A., Urbana.
Musson, J. J., St. Paris.
Pearce, H. C., Urbana.
Pearce, H. M., Urbana.
Pickering, G. W., Urbana.
Preston, H. S., Mutual.
Smith, M. L., Urbana.
Thompson, C. E., No. Lewisburg.
Thompson, F. S., Crayon.
Williams, A. L., No. Lewisburg.
Wolf, J. H., Kings Creek.

ACADEMY OF MEDICINE OF CINCINNATI

Auxiliary since 1875 Annual Meeting in March

Louis Schwab .....President.
J. C. Oliver .....1st Vice-President.
Estella M. Riley.....2d Vice-President.
S. E. Allen .....Treasurer.
W. H. Crane .....Recording Secretary.
F. E. Kugler .....Corresponding Secretary.
M. A. Tate .....Financial Secretary.
A. I. Carson .....Librarian.
Trustees—N. P. Dandridge, J. A. Murphy, J. T. Whittaker.

MEMBERS

Abbott, C. N., 1812 Freeman.
Adams, E. P., 3320 Reading R'd.
Adamson, H. K., Maysville, Ky.
Agin, C. C., 1135 Dayton.
Albers, H. W., 27 E. 12th.
Allen, G. M., 2116 Auburn.
Allen, S. E., 22 W. 7th.
Ashburn, Percy M., 2910 Gilbert.
Atherton, A. L., 124 Garfield Pl.
Ayres, S. C., 14 E. 7th.
Bacharach, Fred, 1015 W. Liberty.
Bailey, Gilbert L., 14 E. 7th.
Bailey, W. W., 106 Cook.
Bange, Theo., 1603 Westwood.
Batchelor, Emma J., 12 Calhoun.
Bauer, Arthur C., 1534 John.
Beebe, Brooks, F., 417 E. 4th.
Belt. Chas., Batavia, O.
Bettman, Henry W., 20 W. 9th.
Bindley, James H., The Groton.
Birchard, A. D., 1201 Harrison.
Blau, J. M. H., 1056 Russell, Covington, Ky.
Bonifield, C. L., 422 W. 4th.
Boylan, Joseph E., 319 Broadway.
Brady, M. B., 3708 Eastern.
Bramble, D. D., 511 Broadway.
Brent, C. P., 125 Garfield Pl.
Brown, A. M., 628 Elm.
Brown, Francis W., 124 W. 9th.
Brown, Henry M., 22 W. 7th.
Brown, Jos. E., 1318 Race.
Brown, Mark A., 628 Elm.
Brown, T. Louis, 2259 Vine.
Bruce, Clara A., 656 Neave.
Bruehl, Gustav, Hopkins & John.
Brunning, F., 411 Broadway.
Buchanan, Henrietta A., 1049 Purcell.
Buckner, James H., 333 E 4th.
Burhans, Chas. A., 546 Clark.
Buttemiller, J. C., 2530 Auburn.
Buxbaum, A. I. F., 1342 E. McMillan, Walnut Hills.
Cadwallader, J. C., Norwood, O.
Caldwell, C. E., The Groton.
Caldwell, Frank, 6th nr. Mound.
Caldwell, J. S., 410 W. 8th.
Cameron, Otis L., 903 Race.
Campbell, Elizabeth, The Somerset, Avondale.
Carothers, Robt., 118 E. 5th, Newport, Ky.
Carpenter, Julia, 908 E. McMillan.
Carrick, A. L., 425 Broadway.

Carroll, Travis, 114 E. 8th.
Carson, Arch. I., 321 Broadway.
Casello, J. B., 627 W. 8th.
Castle, Charles H., 215 W. 9th.
Christen, T. A., 14 E. 7th.
Cilley, Jonathan L., 11 E. 8th.
Clark, B. F., 821 Kenyon.
Cleveland, J. L., 838 W. 7th.
Colter, Leroy S., 3410 Clifton.
Conner, P. S., 215 W. 9th.
Cone, S. E., 704 W. Court.
Cook, H. J., 1411 Elm.
Cook, L. E., 3519 Warsaw.
Crane, W. H., 20 W. 9th.
Cross, F. B., 124 Garfield.
Culbertson, J. C., 317 W. 7th.
Curry, F. C., Milford, O.
Dandridge, N. P., 422 Broadway.
Danziger, Leo, 107 W. 9th.
Davis, Clark, 902 Elm.
Davis, John L., s. e. cor. 4th and Central.
DeBeck, David, 708 Walnut.
DeCourcy, W. E., 827 W. 8th.
Denman, L. M., 135 W. 9th.
DeRoo, B. C., 28 E. McMicken.
Devers, A. B., 3334 Main Ave.
DeWitt, Wm. H., 61 Auburndale Pl., Mt. Auburn.
Dickey, Eliza J., Children's Episcopal Hospital, Main, north of Mason.
Dickinson, T. F., 2457 Eastern.
Dodd, C. W., Neave Bldg.
Dodds, J. W., Mt. Washington, O.
Doerler, Albert, 1208 Walnut.
Donnell, C. L., 905 Baymiller.
Dorschug, Frederick P., s. e. cor. Molitor and Highland.
Dowling, Francis, 216 W. 9th.
Drury, A. G., 625 W. 8th.
Dunham, Kennon, 2513 Auburn.
Dunham, W. H., 830 Dayton.
Eichberg, Joseph, 22 W. 7th.
Eichberg, Julius H., The Groton.
Erwin, J. C., 603 W. 8th.
Evans, Charles Seth, 17 Garfield Pl.
Everts, Orpheus, College Hill, O.
Fackler, George A., 112 Garfield Pl.
Falls, Wm. H., 534 W. 7th.
Fels, Geo. W., 113 W. 6th.
Fennel, O. W., 3018 Jefferson.
Fischer, Philip, 726 Laurel.
Fitzpatrick, T. V., 32 Garfield Pl.
Fletcher, M. H., 11 E. 7th.
Foertmeyer, C. H., 836 W. 8th.
Fogel, Leo J., 708 Clinton.
Forchheimer, Fred., Ortiz Bldg.
Forchheimer, W. F., Ortiz Bldg.
Fraid, N. I., 507 W. 7th.
Freiberg, A. H., 706 Walnut.
French, James M., 420 W. 7th.
Freudenberger, H., 1420 Race.
Gaither, Alfred, The Groton.
Gates, Edward S., 4917 Eastern.
Gavin, W. J., 908 Clark.
Geier, Otto P., Christ's Hospital.
Glaeser, Bertha L., 428 W. 8th.
Good, P. W., 2145 Vine.
Goode, B. P., 1812 Baymiller.
Goode, Geo. H., 14 E. 7th.
Gores, F. C., 938 E. McMillan.
Grandjean, Arthur, 1323 Race.
Greiwe, John E., 1344 Broadway.
Grimes, S. B., 28 W. 7th.
Grimm, Adolph, 49 E. McMicken.
Haile, Geo., n. e. cor. 3d and Broadway.
Haines, W. D., 1606 Freeman.
Hall, Rufus B., 628 Elm.

Harff, B. G., 2843 Woodburn.
Harmon, F. W., Supt. Longview Hospital, Carthage, O.
Harris, James, 286 W. McMicken.
Hart, Thos. P., 533 E. 5th.
Hays, T. W., 1814 Vine.
Heady, J. F., Glendale, O.
Heidingsfield, M. L., 22 W. 7th.
Heise, O. N., 16 Garfield Pl.
Held, H. P., 1901 Vine.
Hellman, F. F., 1327 Broadway.
Hendley, Frank W., 785 E. McMillan.
Hill, R. C., 531 Broadway.
Hillkowitz, Wm., 704 Race.
Hinckley, H. D., 20 W. 9th.
Holmes, C. R., 8 E. 8th.
Holt, Oliver, 134 W. 9th.
Hoppe, Herman H., 32 Garfield Pl.
Hottendorf, L. P., 810 Richmond.
Hughes, W. C., Cleves, O.
Hyndman, Jas. G., 22 W. 9th.
Ingram, Robert, 514 Clark.
Jacob, E., 26 Findlay.
Johnston, J. Ambrose, 412 Everett.
Johnstone, Arthur W., Madisonville, opp. Fairfield.
Jones, G. E., Connersville, Ind.
Jones, I. D., 1014 E. McMillan.
Jones R. C., 2373 Park.
Jones, W. E., 911 E. McMillan.
Joseph, Leopold, 803 Race.
Judkins, Chas. P., The Groton.
Judkins, Wm., 122 Garfield Pl.
Junkerman, G. S., 231 W. Court.
Kammann, Albert A., 2825 Vine.
Kattenhorn, H., 814 E. 3d.
Kearns, Chas., 8th and Madison, Covington, Ky.
Keck, Peter A., 1832 Race.
Kelly, W. H., 1006 Madison, Covington, Ky.
Kemper, Andrew C., 303 Broadway.
Kendig, W. C., Longview Hospital, Carthage, O.
Keyser, John, 722 Clark.
Khuon, Edwin, 1930 Central.
Kiely, W. E., 420 Broadway.
King, J. R., 1268 E. 3d.
Knight, A. L., Madisonville, O.
Knight, Wm., 111 Garfield Pl.
Koehler, Max., 124 W. 9th.
Kramer, S. P., 111 E. 9th.
Krieger, G. L., Madisonville, O.
Krouse, J. L., The Groton.
Kugler, Frank E., 3309 Price.
Kunz, John C., 511 Broadway.
Landis, John H., 815 Race.
Landman, L. H., 503 W. 9th.
Landy, Edwin F., 3015 Colerain.
Langdon, F. W., 5 Garfield Pl.
Lewis, W. E., 409 E. 5th.
Lyle, B. F., 2302 W. 8th.
McCarthy, Ellen F., San Marco Bldg.
McKecknie, J. B., 26 E. 7th.
McKee, E. S., 33 W. 7th.
McMechan, J. C., 639 W. 7th.
Mackenzie, J. C., 20 W. 7th.
MacMillan, Wade, Auburn and Saunders.
Macready, J. H., 608 Delhi.
Malsbary, Geo. E., 1631 Sycamore.
Marcus, Jule E., 411 W. 8th.
Marcus, Jos. C., 411 W. 8th.
Marsh, F. O., 1616 Main.
Martin, Henry, Ashland, Ky.
Medaris, L. A., 1639 Tremont.
Meguire, T. D., 1552 Chase.
Meyers, C. H., 1568 Elm.

Miles, A. J., 9 E. 8th.
Minor, C. L., 8 E. 8th.
Mitchell, E. W., 124 Garfield Pl.
Mitchell, Giles S., 435 W. 8th.
Molloy, J. J., 717 Madison, Covington, Ky.
Molony, L. A., 731 W. 5th.
Morgenstern, A., 124 W. 9th.
Murnan, J. R., 1005 Madison, Covington, Ky.
Murphy, John W., The Groton.
Murphy, J. A., 213 W. 7th.
Neff, Wallace, 628 Elm.
Neufarth, L., Mt. Healthy, O.
Nickles, Samuel, 1406 John.
Norton, O. D., 2227 Highland.
Oliver, John C., 628 Elm.
Orr, Geo. B., 423 E. 4th.
Palmer, C. D., Main and Forest.
Pearce, C. T., The Groton.
Phelps, Albert V., 517 Central.
Pieck, Chas. S., Covington, Ky.
Poole, Allyn C., 2913 Woodburn.
Porter, W. D., 2531 Gilbert.
Prugh, G. W., 2101 Eastern.
Querner, L. A., 1130 Race.
Rachford, B. K., 323 Broadway.
Ransohoff, Joseph, 706 Walnut.
Ratterman, Bernard J., 1532 Elm.
Ravogli, A., 5 Garfield Pl.
Reamy, T. A., Reading Road and Oak.
Reed, Chas. A. L., The Groton.
Reemelin, Rudolph H., 1209 Elm.
Renneker, A. P., 1550 Baymiller.
Reynolds, C. W., 48 W. 4th, Covington, Ky.
Ricketts, Edwin, 415 Broadway.
Ricketts, Merrill, 415 Broadway.
Riley, Estella M., 728 W. 7th.
Roads, W. M., 17 Garfield Pl.
Rosenbaum, M., 17 E. 12th.
Rothenberg, S., 626 W. 8th.
Rowe, James W., 727 E. McMillan.
Rulison, Ida B., 811 Considine.
Sanfeld, Bernard, 20 W. Elder.
Saffin, Wilson, Carthage, O.
Sattler, Eric E., 109 Garfield Pl.
Sattler, Robt., The Groton.
Schenck, W. Edwards, 5 Garfield Pl.
Schmidt, T. W., 116 E. 9th.
Schoolfield, C. B., 631 6th, Dayton, Ky.
Schwab, E., 1625 Madison.
Schwab, Louis, 1641 Blue Rock.
Schwagmeyer, August, 1909 Elm.
Seeley, W. W., 4th and Broadway.
Shaller, J. M., 309 Webster.
Shaw, W. E., 2974 Colerain.
Shields, Edward H., 22 W. 7th.
Shumard, C. E., 4212 Brookside.
Sittel, Theo., 520 E. Pearl.
Solar, F. M., 1741 Westwood.
Southgate, F. H., Newport, Ky.
Southgate, Louise, 9th and Race, Brittany Bldg.
Sparger, H. V., 313 Broadway.
Speidel, C. G. E., 1215 Elm.
Stanton, Byron, 931 Dayton.
Stapleford, A. D., 2647 Western.
Stark, Oscar W., 13 E. 8th.
Stark, Sigmar, 13 E. 8th.
Stephan, Jos. E., 1509 Race.
Stevenson, J. W., U. S. Marine Hospital.
Stewart, Robt. W., Ortiz Bldg.
Straehley, Erwin O., 1814 Linn.
Striker, Louis, The Groton.
Sudhoff, G. F., 1414 Elm.
Taft, J., 628 Elm.
Taft, Wm., 628 Elm.

Tangeman, C. W., 20 W. 9th.
Tate, Magnus A., 3d and Broadway.
Tauber, B., 213 W. 9th.
Taylor, W. F., 235 E. 4th.
Taylor, Wm. H., 553 W. 7th.
Terrill, Jonas C., Covington, Ky.
Thompson, John A., 628 Elm.
Thorner, Max., The Groton.
Thornton, R. H., Newport, Ky.
Thrasher, A. B., The Groton.
Thrasher, Wade, The Groton.
Thuman, G. H., 1702 Elm.
Topmoeller, Jos. M., 823 Bank.
Trush, J., 437 E. 5th.
Tucker, A. A., Betts and Central.
Twitchell, George B., 1616 Freeman.
Vail, Derrick T., 8 E. 8th.
Van Meter, C. B., 2941 Colerain.
Walker, Edward W., 30 Garfield Pl.
Watson, Joseph, 2141 Eastern.
Weaver, W. B., 32 Garfield Pl.
Wendel, H. C., 519 W. McMicken.
Wenning, W. H., 722 Laurel.
Whitacre, Horace J., 2120 Auburn.
White, Thomas P., 430 Clark.
Whittaker, Jas. T., 32 Garfield Pl.
Williams, John G., Cheviot, O.
Williams, W. M., The Groton.
Williamson, C. H., Newport, Ky.
Wilson, John B., 206 E. 4th.
Winn, J. J., Norwood, O.
Withrow, John M., 526 W. 7th.
Wittcamp, T. M., 1437 Walnut.
Wolfstein, David I., 22 W. 7th.
Woodward, Warren R., 108 W. 9th.
Young, Dan S., 418 W. 7th.
Zenner, Philip, Glenn Bldg., 5th and Race.
Zinke, E. Gustav, 13 Garfield Pl.

CLARK COUNTY MEDICAL SOCIETY

Auxiliary since 1877 — Annual Meeting in May

H. H. Seys.....President.
J. H. Buckingham..... .....1st Vice-President.
J. W. Hulick..... .....2d Vice-President.
Bennetta D. Titlow .....Secretary and Treasurer.

MEMBERS

Baldwin, H., Springfield.
Bliss, C., Springfield.
Bryant, W. G., Springfield.
Buckingham, J. M., Springfield.
Carroll, T. M., Springfield.
Davis, Ben New Carlisle.
Davis, E. B., North Hampton.
Davy, J. O., Springfield.
Dugan, J. P., Springfield.
Gatchell, W. T., Springfield.
Gotwald, D. K., Springfield.
Harris, E. C., Springfield.
Hazzard, J. S. R., Springfield.
Heble, Robt., Enon.
Hulick, J. W., Springfield.
Hunt, W. S., Springfield.
Hutchings, S. R., Springfield.
Kay, I., Springfield.
Kay, C. H., Springfield.
McClintock, A., New Moorfield.

Moore, J. Z., South Charleston.
Myers, J. E., Springfield.
Myers, N., Springfield.
Patton, M. V., Springfield.
Riegel, F., North Hampton.
Rodgers, J. H., Springfield.
Seys, H. H., Springfield.
Smith, W. A., Springfield.
Smith, E. H., Vienna Cross R'ds.
Titlow, B. D., Springfield.
Vance, A. H., Springfield.

CLERMONT COUNTY MEDICAL SOCIETY

Auxiliary since 1854 Annual Meeting in October

E. M. Brown .....President.
J. H. Andrews .....Vice-President.
E. C. Ireton .....Secretary.
P. Kennedy ..... Treasurer.

MEMBERS

Abbott, J. D., Bethel.
Anderson, F. W., Madisonville.
Anderson, W. S., Newtonsville.
Andrews, J. H., Goshen.
Ashburn, A. W., Batavia.
Ashburn, P. M., Cincinnati.
Belt, R. C., Milford.
Bennett, C. A., Withasville.
Bishop, L. W., Batavia.
Bishop, L. M., Loveland
Bivins, W. A., New Hope.
Bradley, Ed., Batavia.
Brown, H. M., Cincinnati.
Brown, E. M., Amelia.
Bryan, S. A., Point Pleasant.
Canter, S. A., Pt. Isabel.
Carmichael, W. A., Loveland.
Combs, J. S., Owensville.
Curry, F. C., Milford.
Darby, F. H., Columbus.
Dickinson, F. F., Columbia.
Donham, H. D., Mt. Washington.
Ellsberry, Wm., Bethel.
Erdman, R. F., New Richmond.
Fee, E. B., Georgetown.
Fitzpatrick, L. V., Cincinnati.
Foromorin, J. L., Marathon.
Gordon, T. W., Georgetown.
Hill, F. E., Neville.
Hines, G. L., Williamsburg.
Hulick, J. W., Springfield.
Ireton, E. C., Marathon.
Kennedy, C. L., Laurel.
Kennedy, P., Laurel.
Love, J. H., Hamersville.
Love, Wesley, Higginsport.
McKee, A. B., Felicity.
McKibben, J. T., Cincinnati.
McKibben, Wm., Cincinnati.
Marsh, M. I., Cedarville.
Mann, J. W., Newtonsville.
Mitchell, T. A., Owensville.
Moore, A. C., Amelia.
Morris, A., Goshen.
Mullin, T. J., New Richmond.
Redrow, Isaac, Williamsburg.
Richardson, J. P., Bantam.
Scott, Wm., Loveland.
Scott, Thos., New Hope.
Spence, C. J., Mt. Carmel.
Strope, W. J., Hamersville.
Thompson, W. E., Bethel.
Tucker, W. E., Felicity.
Witham, Samuel, Withamsville.

CLEVELAND MEDICAL SOCIETY

Auxiliary since 1896 Annual Meeting in January

Aug. F. House .....President.
F. E. Bunts .....1st Vice-President.
E. G. Carpenter .....2d Vice-President.
J. M. Ingersoll .....Recording Secretary.
F. C. Taylor .....Treasurer.
W. T. Howard .....Pathologist.
Censors—R. J. Wenner, W. T. Corlett, P. M. Foshay, R. E. Skeel, J. H. Lowman.
Trustees—O. B. Campbell, ('99); J. B. McGee, ('99); W. A. Knowlton, ('99); H. S. Straight, ('00); D. S. Hanson, ('00); C. B. Parker, ('00); N. S. Scott, ('01); H. C. Brainerd, ('01); Chas. Gentsch, ('01).

RESIDENT MEMBERS

Albl, M., 1464 Broadway.
Aldrich C. J., 744 Prospect.
Allen, D. P., 278 Prospect.
Arnold, G. D., 1015 Cedar.
Ashmun, G. C., 794 Republic.
Bailey, Robt., 468 Willson.
Baker, A. R., 122 Euclid.
Baker, L. K., 1257 Euclid.
Bard, I. W., 1341 Lorain.
Bard, L. A., 97 Merchant.
Barger, W. T., 484 Wade Park.
Becker, H. A., 1207 Pearl.
Belt, J. H., 1434 Willson.
Bernstein, S. L., 864 Woodland.
Bliss, H. C., 413 Woodland.
Boesger, M. A., 862 Lorain.
Boggs. Jessie, 1257 Euclid.
Borts, M., 975 Woodland.
Brainerd, H. C., 89 Euclid.
Brashear, B. B., 211 Prospect.
Breck, T. B., 1234 Cedar.
Brockett, A. J., 32 Hawthorne.
Brokaw, W. F., 1040 Willson.
Bruner, W. E., 514 New England Bldg.
Buell, J. J., 604 Pearl.
Bunts, F. E., Osborne Bldg.
Burdick, H. J., 519 Cedar.
Burke, T. A., 176 Euclid.
Bushnell, Sophia B., 517 Cuyahoga Bldg.
Byrne, P. J., 299 Viaduct.
Calhoun, S. F., 69 Crawford.
Campbell, A. D., 1960 St. Clair.
Campbell, O. B., 993 Cedar.
Capener, W. H., 415 Case.
Carey, M. J., 1748 Cedar.
Carmichael, D. A., U. S. Marine Hospital.
Carter, E. P., Lakeside Hospital.
Case, G. B., 106 Euclid.
Chadwick, L. S., 2267½ Euclid.
Chakijian, H. K., 390 Prospect.
Chatfield, A. E., 357½ Prospect.
Childs, L. W., 1062 Pearl.
Clapp, H. T., 122 Euclid.
Clark, E. A., 122 Euclid.
Clark, Frank S., 337 Prospect.
Coates, B. O., 29 Euclid.
Conrad, Wm., 933½ Woodland.
Cook, A. J., 2220 Willson.
Cook, J. E., 514 New England Bldg.

Corlett, W. T., 553 Euclid.
Cotton, C. E., 350 Jennings.
Crile, G. W., 275 Prospect.
Crowe, E. P., 26 Hough.
Cushing, E. F., 967 Prospect.
Cutler, E. J., The Arcade.
Darby, J. E., 29 Euclid.
Davis, F. W., 128 Franklin.
Davidson, E. M., 106 Euclid.
Dennison, A. N., Case Bldg.
Dickenson, J., 32 Sibley.
Dotterweich, F. V., 780 Lorain.
Dutton, C. F., 122 Euclid.
Ebersole, W. G., 176 Euclid.
Ehret, G. A., 89 Euclid.
Elliott, A. S., 2794 Euclid.
Erwin, J. J., 890 Doan.
Esch, W. J., 679 St. Clair.
Eyman, H. C., Cleveland State Hospital.
Farnsworth, G. B., 1905 Pearl.
Feil, G. R., 864 Woodland.
Fletcher, H. M., 176 Euclid.
Foote, C. G., 961 Prospect.
Fortlage, H., 451 Pearl.
Foshay, P. M., 514 New England Bldg.
Franke, F. C., 701 Woodland.
Friedman, I., 465 St. Clair.
Friedrich, Martin, The Osborne.
Fritch, J. C., 380 Pearl.
Frost, Geo. M., 137 Streator.
Fry, R. D., 176 Euclid.
Gallagher, J. V., 800 Superior.
Gentsch, Chas., 167 Franklin.
George, O. E., 1207 Pearl.
Goetz, E. P., 966 Payne.
Goetz, F. E., 581 Woodland.
Grossman, D. W., 1544 Superior.
Gunn, R. D. A., 817 Willson.
Hamann, C. A., 282 Prospect.
Handerson, H. E., 444 Dunham.
Handrick, F. A., Pearl and Detroit.
Hanson, D. S., 1419 Broadway.
Havlicek, F. J., 1145 Lorain.
Heath, J. A., 10 Marquette.
Heimlich, D., 521 Woodland.
Herbkersman, F. H., 1831 Broadway.
Herrick, H. J., 365 Erie.
Herrick, H. J., Jr., 365 Erie.
Herrick, W. H., 176 Euclid.
Hess, J. L., 1944 Euclid.
Hobson, J. F., 429 Prospect.
Holliday, B. W., 520 Prospect.
Hoover, C. F., 282 Prospect.
Hosick, W. A., 1613 Woodland.
House, A. F., 1059 Superior.
Howard, W. T., Jr., W. R. U. Med. Coll.
Humiston, W. H., 122 Euclid.
Hutchins, Fannie C., Cleveland State Hospital.
Hyde, W. H., 247 W. Madison.
Ingersoll, J. M., 50 Euclid.
James, W. S., 1519½ Lorain.
Johnson, W. D., 1111 Lorain.
Jones, J. Arthur, 424 Willson.
Kaestlen, S. E., 615 Lorain.
Kelley, S. W., 1150 Superior.
Kinnaman, C. L., 1474 Cedar.
Kinnaman, A. S., 941½ Woodland.
Knowlton, W. A., 530 Jennings.
Kofron, J. V., 1560 Broadway.
Kolb, M. G., 1007 Pearl.
Kopfstein, F. T., 2283 Superior.
Krebs, P. H., 1007 Pearl.
Lauder, E. S., The Osborne.
Lee, H. J., 73 Tilden.
Leick, Geo. F., 503 Prospect.
Lewis, J. M., 176 Euclid.
Lincoln, Wm. R., Osborne Bldg.

Lincoln, Walter, Osborne Bldg.
Loewenthal, M., 1220 Willson.
Lower, W. E., Osborne Bldg.
Lowman, J. H., 441 Prospect.
Lucas, V. C., 1158 Pearl.
Lucas, W. H., 862 Lorain.
Luck, H. C., 122 Euclid.
MacTaggart, R. G., 436 Pearl.
McGee, J. B., 1405 Woodland.
McQuiston, H., 19 Walker.
McVeigh, J. A., 962 Willson.
Mabley, H. C., 71 Oakdale.
Martin, R. H., 389 Cedar.
Martin, T. C., 1077 Prospect.
Marvin, A. H., 106 Euclid.
Miller, Amanda H., 997 Pearl.
Millikin, B. L., 278 Prospect.
Mustard, J. W., 959 Willson.
Nachtigall, B. G. A., 1191 Pearl.
Nevison, W. H., 278 Prospect.
Nungesser, J. J., 103 Lyman.
Nydegger, R., 166 Jennings.
Ormsby, H. B., Central and Brownell.
Orwig, G. A., 1108 Woodland.
Oster, L. W., 1234 St. Clair.
Parke, M. J., 337 Prospect.
Parker, C. B., 425 Euclid.
Paulin, N. O., 1232 Euclid.
Pav, Anton, 1133 Broadway.
Payne, F. A., 616 Willson.
Pelton, R. P., 2016 Detroit.
Perkins, D. S., 1273 Euclid.
Perrier, J., 1014 Willson.
Peskind, A., 1354 Willson.
Pipes, J. R., 429 Prospect.
Pollock, R., 747 Hough.
Powell, H. H., 467 Prospect.
Pressey, A. J., 900 Fairmount.
Quirk, H. W., 1232 Euclid.
Riley, J. A., 1314 Cedar.
Robb, Hunter, 1342 Euclid.
Rogers, H. W., 128 Franklin.
Rose, E. J., Willson and Central.
Rosenberg, E., 1597 Woodland.
Rosenwasser, M., 722 Woodland.
Rosewater, N., 864 Woodland.
Russell, G. C., 312 Prospect.
Sadler, L. A., 959 Lorain.
Sager, B. E., 243 Crawford.
Sawyer, J. P., 122 Euclid.
Sawyer, P. H., 54 Streator.
Scott, N. Stone, 531 Prospect.
Shackleton, W. E., 122 Euclid.
Sherman, H. G., 29 Euclid.
Shirkey, U. S. L., 1357 Lorain.
Siegelstein, L. E., 299 Woodland.
Sipher, J. N., 76 Euclid.
Skeel, R. E., 1156 Pearl.
Smith, C. W., 122 Euclid.
Smith, D. B., Case Bldg.
Smith, F. K., 312 Prospect.
Smith, G. S., 1273 Euclid.
Snow, L. B., 122 Euclid.
Spence, H. L., 1160 E. Madison.
Spenzer, J. G., 370 Central.
Spurney, A. F., 864 Woodland.
Steiner, A., 766 Woodland.
Stepp, M., 7 Minnesota.
Steuer, D. B., 465 St. Clair.
Stevenson, G. W., 1439 Woodland.
Stewart, G. N., W. R. U. Med. Coll.
Stoskopf, Geo., 1691 Pearl.
Stotter, J., 176 Euclid.
Stovering, F. A., 334 Pearl.
Straight, H. S., 321 Hickox Bldg.
Stuart, C. C., 436 Jennings.
Sykora, J., 1449 Broadway.
Taylor, F. C., 128 Franklin.
Thomas, J. J., 665 Hough.
Thomas, O. T., 763 Scranton.
Towslee, L. G., 407 Osborne Bldg.

Tuckerman, L. B., 298 Central.
Turner, C. A., 307 Pearl.
Upson, G. D., 302 Hickox Bldg.
Upson, H. S., 514 New England Bldg.
Vincent, H. G., 499 Pearl.
Wagner, H. G., 10 Granger.
Warner, W. C., 739 Hough.
Watson, G. N., 1863 Pearl.
Weber, W. C., 405 Prospect.
Welty, C .F., The Hollenden.
Wenner, R. J., 1059 Superior.
Wheatley, Wm. E., Lakeside Hospital.
White, D. K., Osborne Bldg.
Williams, T. B., 145 Quincy.
Wirt, W. E., 122 Euclid.
Wooldridge, C. W., 933½ Woodland.
Yarian, N. C., 1135 Detroit.

NON-RESIDENT MEMBERS

Adams, C. W., Jefferson.
Arner, A. L., Jefferson.
Amidon, H. N., Painesville.
Ballard, H. C., Columbiana.
Bauer, M. M., Lake.
Beach, A. M., Niles.
Bell W. H., Bellevue.
Berneike, R. A., Collinwood.
Booth, Chas. C., Youngstown.
Bourn, E. L., Brecksville.
Boyd, Jas. P., Akron.
Bozovsky, V. D., Monroeville.
Brant, A. C., Canton.
Breck, Theodore, Brecksville.
Bunce, W. C., Oberlin.
Burrows, S. S., Geneva.
Carlisle, I. C., Glenville.
Carpenter, E. G., Columbus.
Chamberlain, W. F., Akron.
Chapman, Byron, Copley.
Clark, A. M., Youngstown.
Cleaver, J. V., Akron.
Cox, S. S., Lorain.
Craig, J. Harvey, Mansfield.
Dickson, J. S., Ashtabula.
Eldridge, F. A., Berlin Heights.
Ellsworth, W. O., Austinburg.
Englebry, F. E., Vermillion.
Everhard, N. S., Wadsworth.
Falor, O. N., North Baltimore.
Feister, H. A., Jr., Newton Falls.
Fox, C. L., Kingsville.
Fraunfelter, Jas., Canton.
Gamble, R. V., New London.
Gardner, D. S., Massillon.
Gardner, J. F., West Brookfield.
Gibson, R. D., Youngstown.
Goodwin, E. M., Glenville.
Hall, H. L., North Amherst.
Handler, S., 670 N. St. Paul, Rochester, N. Y.
Hanna, D., Oberlin.
Hannum, E. S., Mantua Station.
Harmon, J. D., Warren.
Haskins, H. D., Strongsville.
Hawley, E. N., Norwalk.
Haynes, J. T., Sandusky.
Hiddleson, C. S., Atwater.
Hill, E. W., Glenville.
Hine, G. W., Berlin Heights.
Hitchcock, E., Akron.
Hobson, J. F., Lakewood.
Hoover, D. E., Warren.
Hopkins, A. W., Ashtabula.
Howard, A. B., Cuyahoga Falls.
Humphrey, C. M., Akron.
Hutton, C. F., Minerva.
Ingersoll, A. J., Mentor.
Jacobs, H. H., Akron.
Jacobs, W. C., Akron.

Jameson, G. C., Oberlin.
Johnson, Wm. H., Collins.
Jones, A. W., Lakewood.
Jones, Dallas K., Canal Fulton.
Jones, D. J., Girard.
Kinnaman, R. C., Ashland.
Lanterman, G. S., Bellevue.
Lathrop, G. C., Dover.
Leet, W. H., Conneaut.
Leitch, A. J., Niles.
Leonard, F. E., Oberlin.
Leonard, W. W., Akron.
Leroy, B. R., Chagrin Falls.
Linden, W. E., South Brooklyn.
Loney, D. W., Olena.
Love, M. J., Bloomingville.
Lowe, J. W., Mentor.
McConkey, W. J., Canton.
Mantley, Chas., Minerva.
Maynard, O. T., Elyria.
Merriman, D. J., Painesville.
Miller, M. F., Wadsworth.
Miner, A. G., Niles.
Myers, I. A., Shelby.
Noble, C. D., Oberlin.
Ohlmacher, A. P., Gallipolis.
Oviatt, W. H., Canal Dover.
Page, H. M., Hiram.
Power, H. W., Amherst.
Rogers, J. H., Louisville.
Rhu, Aug., Marion.
Ruedy, R. E., Columbus.
Sabin, T. M., Warren.
Schilling, Chas. E., Canton.
Searl, W. A., Yankton, S. D.
Seidell, R. R., Bedford.
Shane, G. A., Waynesburgh.
Smith, W. H., Akron.
Smith, J. T., Collinwood.
Snow, Chas. A., Garrettsville.
Snyder, G. N., La Grange.
Stamm, M., Fremont.
Starr, G. L., Hudson.
Stoll, C. W., Dover.
Tanner, C. H., Willoughby.
Tidball, A. H., Garrettsville.
Tower, B. M., Conneaut.
Tuttle, Carl, Berlin Heights.
Tressel, J. H., Alliance.
Tripp, Q. A., Nottingham.
Upson, F. W., Conneaut.
Walker, A. B., Canton.
Ward, C. S., Warren.
Ward, W. A., Conneaut.
Wenner, H. L., Tiffin.
Wheelan, R. E., Youngstown.
White, W. W., Ravenna.
Wood, J. S., Collinwood.
Woodward, R. M., M. H. S., Reedy Island Quarantine, Del.
Wright, S. J., Tallmadge.
Young, D. H., Chicago, Ohio.
Zimmerman, H. A., Youngstown.

CLINTON COUNTY MEDICAL SOCIETY

Auxiliary since 1879 Annual Meeting in May

G. W. Wire .....President.
E. Briggs ..... Secretary.
N. B. Van Winkle .....Treasurer.
List of Members not reported.

COLUMBUS ACADEMY OF MEDICINE

Auxiliary since 1894

Frank Warner ..... President.
C. S. Hamilton .....Vice-President.
H. M. Platter .....Secretary.
F. W. Blake .....Treasurer.

MEMBERS

Baldwin, J. F.,
Barnhill, J. U.,
Bartley, M. A.,
Beery, J. E.,
Bethauser, C. M.,
Blackburn, M. E.,
Blake, F. W.,
Bliele, A. M.,
Bowen, A. H.,
Brown, J. E.,
Burgoyne, J. A.,
Callinan, D. F., Corning, O.
Carter, C. C.,
Chapman, L. J.,
Clark, C. F.,
Clouse, G. M.,
Cole, W. U.,
Coleman, N. R.,
Collison, F. J.,
Combs, R. D.,
Cooper, Albert.,
Cooperrider, C. A.,
Deuschle, W. D.,
Dick, W. L.,
Dixon, M. T.,
Dumm, S. C.,
Dunham, J. M.,
Early, L. M.,
Emerick, E. J.,
Evans, A. E.,
Fraker, H. C.,
Frame, J. A.,
Frankenburg, O.,
Fullerton, E. B.,
Gilliam, D. Tod,
Gilliam, E. M.,
Gordon, J. L.,
Graham, J. C., Denver, Colorado,
Griffin, A. E.,
Hamilton, C. S.,
Hamilton, W. D.,
Hatton, E. M.,
Havens, W. V.,
Hendrixson, H.,
Hendrixson, O. P.,
Henry, R. H.,
Herbst, E.,
Hoover, T. C.,
Johnson, Alice M.,
Jones, H. S.,
Kahn, Louis,
Kerr, J. M.,
Kinsman, D. N.,
Landon, C. P.,
Lawrence, F. F.,
Lawrence, J. C.,
Lindsay, S. C.,
Linebaugh, J. A.,
Lippitt, B. F.,
Loving, Starling,
McClure, J. A.,
Magruder, J. J.,
Marshall, G. M.,
Means, C. S.,
Moore, D. L.,
Moore, H. M. W.,
Murphy, J. A.,
Nash, W. H. H.,
Park, James,
Parker, C. A.,
Phillips, O. S.,
Pilcher, J. E., Fort Crook, Neb.,
Platter, H. M.,
Probst, C. O.,
Rankin, T. W.,
Rauschkolb, Chas.,
Richardson, A. B.,
Rogers, W. K.,
Rukenbrod, E. P.,
Rutledge, Ella B.,
Scheuller, J. B.,
Schriner, P. D.,
Schwallie, W. A.,
Shepherd, C. J.,
Stein, G. S.,
Steinfeld, A. M.,
Steward, S. H.,
Stillman, F. L.,
Stockton, Geo.,
Stout, J. A.,
Taylor, C. M.,
Taylor, S. B.,
Timberman, A. J.,
Turney, C. F.,
Upham, J. H. J.,
Van Fossen, J. A.,
Wardlow, Yeatman,
Warner, Frank,
Waters, G. M.,
Westervelt, W. A.,
Whitaker, H. W.,
White, G. M.,
Whitehead, H.,
Whitten, W. F.,
Wilcok, S. S.,
Wilson, E. F.,
Wilson, E. J.,
Wilson, Ida M.,
Winders, Frank,
Wissinger, T. K.,
Wirth, R.,
Wolfe, A. C.,
Woodruff, E. W.,
Youmans, T. G.

CRAWFORD COUNTY MEDICAL SOCIETY

Auxiliary since 1893 Annual Meeting in April

J. I. King .....President.
J. Bland ..... Vice-President.
L. Kemp ..... Secretary.
F. M. Virtue .....Treasurer.

MEMBERS

Baker, C. L., Kirkpatrick.
Bevington, H. S., Sulphur Spr'gs.
Blair, G. O., Leesville.
Bland, J., Bucyrus.
Chesney, J. A., Bucyrus.
Clouse, W. H., Crestline.
Duncan, A. M., Bucyrus.
Fitzsimmons, J. F., Bucyrus.
Guiss, W. H., Tyro.
Kelly, W. J., Galion.
Kemp, Lucia, Bucyrus.
King, J. I., Martel.
McLeod, C. H., Chatfield.
Manderville, C. C., Galion.
Moses, J. B., Crestline.
Ott, W. G., New Winchester.
Reininger, C. M., New Washington.
Ridgeway, N. B., Galion.
Trimble, C. E., Crestline.
Van Natta, Wesley, Poplar.
Van Natta, H. L., Seal.
Virtue, D. B., Lykens.
Virtue, F. M., Sulphur Springs.

CUYAHOGA COUNTY MEDICAL SOCIETY

Auxiliary since 1879 Annual Meeting in April

F. E. Bunts .....President.
H. W. Rogers .....1st Vice-President.
Chas. Hintzelman .....2d Vice-President.
Chas. C. Stuart .....Secretary.
L. S. Chadwick .....Treasurer.
Censors—A. J. Brockett, F. A. Payne, D. S. Hanson.
Trustees—J. D. Jones, ('99); P. H. Sawyer, ('00); H. E. Handerson, ('01); A. G. Hart, ('02); W. A. Knowlton, ('03).
Honorary Members—Dr. Martin Luther Brooks, 289 Prospect Street; Dr. Henry Kirke Cushing, 967 Prospect Street; Dr. G. C. E. Weber, Nuremberg, Germany.

MEMBERS.

Albl, Michael A., 1464 Broadway.
Aldrich, Charles J., 744 Prospect..
Allen, Dudley P., 278 Prospect.
Arms, Charles C., 1213 New England Bldg.
Ashmun, George C., 794 Republic.
Baker, Albert R., 122 Euclid.
Baker, Cornelius, 553 Kinsman.
Becker, H. A., 1207 Pearl.

Boggs, Jessie, 1257 Euclid.
Brashear, Basil B., 211 Prospect.
Brockett, Andrew J., 32 Haw-thorne.
Bunts, Frank E., 275 Prospect.
Burdick, Halbert J., 519 Cedar.
Burton, Erasmus D., East Cleve-land.
Campbell, Oscar B., 993 Cedar.
Carlisle, Irwin C., Doan st., Glen-ville.
Chadwick, Leroy S., 1824 Euclid.
Corlett, William T., 553 Euclid.
Cotton, Clyde E., 350 Jennings.
Crile, George W., 275 Prospect.
Cushing, Edward F., 967 Pros-pect.
Dutton, Chas. F., 122 Euclid.
Eyman, Henry C., Cleveland State Hospital.
Foote, C. G., 961 Prospect.
Fraser, John M., 950 Cedar.
Gentsch, Charles, 167 Franklin.
Handerson, Henry E., 444 Dun-ham.
Hanson, David S., 1419 Broad-way.
Hart, Albert G., 102 Jennings.
Herrick, Henry B., 2228 Euclid.
Herrick, Henry J., 367 Erie.
Hintzelman, Charles, 86 Randall.
Hobson, John F., Lakewood, O.
Holliday, Benjamin W., 520 Prospect.
Holliday, William W., 2588 Broadway.
Hoover, Charles F., 282 Prospect.
Howard, William T., Jr., W. R. U. Medical College.
Isom, John F., 69 Kennard.
James, William S., 1519½ Lorain.
Jenks, William O., Nottingham.
Jones, John D., 1631 Harvard.
Kaestlen, Samuel E., 615 Lorain.
Kelley, Samuel W., 1150 Supe-rior.
Knowlton, William A., 530 Jen-nings.
Kolb, Matthew G., 1007 Pearl.
Krause, Bernhard, 132 Woodland.
Lee, Howard J., 71 Tilden.
Leick, George F., 503 Prospect.
Lincoln, Wm., 275 Prospect.
Linden, Wm. E., South Brook-lyn, O.
Lower, Wm. E., 275 Prospect.
Lowman, John H., 441 Prospect
McGee, John B., 1405 Woodland.
McQuiston, Henry, 19 Walker.
McVeigh, J. A., 962 Willson.
Marvin, Albert H., 106 Euclid.
Martin, T. C., 1077 Prospect.
Millikin, Benjamin L., 278 Pros-pect.
Morton, Fayette J., 959 Lorain.
Nevison, Wm. H., 278 Prospect.
Norton, Francis B., 19 Miles.
O'Neil, M. J., 1666 Superior.
Oster, Louis W., 1234 St. Clair.
Oswald, Benjamin F., 2010 De-troit.
Parker, Charles B., 425 Euclid.
Payne, Frank A., 89 Quinby.
Perkins, David S., 1273 Euclid.
Perrier, John, 1014 Willson.
Peskind, Arnold, 1354 Willson.
Powell, Hunter H., 467 Pros-pect.
Quirk, Howard W., 1232 Euclid.
Rogers, Henry W., cor. Pearl and Franklin.
Russell, George C., 312 Prospect.
Sager, B. E., 243 Crawford rd.
Sawyer, John P., 122 Euclid.

Sawyer, Pascal H., 54 Streator.
Scott, N. Stone, 531 Prospect.
Shackleton, W. E., 122 Euclid.
Sherman, Harris G., 29 Euclid.
Sipher, J. N., 76 Euclid.
Skeel, Roland E., 1156 Pearl.
Smith, Charles W., 122 Euclid.
Smith, Frederick K., 312 Prospect.
Snow, Lexor B., 158 Lincoln.
Somerville, George H., 2549 Broadway.
Spenzer, John G., 370 Central.
Stepp, Morris D., 7 Minnesota.
Stevenson, George W., 1439 Woodland.
Stillman, George B., 1318 Cedar.
Straight, Howard S., 323 Hickox Bldg.
Stuart, Chas. C., 1207 Pearl.
Sykora, Joseph, 1449 Broadway.
Tuckerman, L. B., 298 Central.
Watson, George N., 1869 Pearl.
Weber, William C., 405 Prospect.
Wheatley, Wm. E., Lakeside Hospital.
White, D. K., 275 Prospect.
Woodbridge, J. E., 637 Prospect.

DEFIANCE COUNTY MEDICAL SOCIETY

Auxiliary since 1897

L. G. Thacker ..... President.
J. D. Westrick ..... Vice-President.
J. J. Reynolds ..... Secretary and Treasurer.

MEMBERS

Aldrich, P. H., Defiance.
Belau, Nettie, Defiance.
Coombs, J. M., Hicksville.
Coy, M. C., Defiance.
Denman, J. K., The Bend.
Finch, R. W., Defiance.
Hoover, Kate, Defiance.
Huffman, G. W., Defiance.
Kimmont, T. C., Hicksville.
Lindersmith, H. C., Sherwood.
Powell, W. S., Defiance.
Replogle, M. V., Evansport.
Reynolds, J. J., Defiance.
Slocum, Chas. E., Defiance.
Stevens, M. B., Defiance.
Thacker, L. G., Defiance.
Westrick, J. D., Defiance.

DELAWARE COUNTY MEDICAL SOCIETY

Auxiliary since 1898

J. McCann ..... President.
C. E. Talley ..... Vice-President.
J. B. Woodworth ..... Secretary.
W. M. Semans ..... Treasurer.
C. W. Chidester ..... Librarian.

MEMBERS

Andrus, H. F., Constantia.
Bessie, Henry, Delaware.
Chidester, C. W., Delaware.
Cowls, G. E., Ostrander.
Crickard, W. F., Delaware.
Fowler, W. S., Delaware.

Fay, D. C., Ostrander.
Gage, F. L., Berkshire.
Hyatt, E. H., Delaware.
Hedges, W. B., Delaware.
Hughes, D. E., Delaware.
James, J. K., Delaware.
Kerney, C. E., Delaware.
McCann, J., Delaware.
Murray, F. M., Delaware.
McIntyre, Wm., Warrensburg.
Main, A. E., Delaware.
Ropp, W. T., Delaware.
Semans, W. M., Delaware.
Semans, E. M., Delaware.
Sims, W. M. T. S., Lewis Center.
Stickney, F. A., Kilbourne.
Talley, C. E., Powell.
Westbrook, A. E., Ashley.
Watts, J. W., Delaware.
Willey, P. W., Lewis Center.
Welch, Calvin, Delaware.
Woodworth, W. H., Delaware.
Woodworth, J. B., Delaware.

EASTERN OHIO MEDICAL ASSOCIATION

Auxiliary since 1894 Annual Meeting in April

H. W. Nelson .....President.
Vice-Presidents—J. S. Campbell, J. F. Whitaker, J. M. Hogan, W. L. England.
J. C. M. Floyd ..Corresponding Secretary and Treasurer.
J. W. Cooper .....Recording Secretary.
Honorary Members—J. J. Buchanan, M. D., Pittsburg, Pa.; F. Savary Pearce, M. D., Philadelphia, Pa.; C. A. L. Reed, M. D., Cincinnati, O.; J. M. Swan, M. D., Canton, China; S. L. Jepson, M. D., Wheeling, W. Va.

MEMBERS

Andrews, O. P., East Liverpool.
Andrews, R., East Liverpool.
Bailey, W. N., East Liverpool.
Barkhurst, S. O., Smithfield.
Blazer, H. E., Salineville.
Bozman, H. E., New Alexandria.
Calhoun, W. M., East Liverpool.
Campbell, J. S., Wellsville.
Carroll, W. L., Toronto.
Clark, W. R., East Liverpool.
Cole, C. C., Bridgeport.
Collins, B. F., Toronto.
Colville, G. H., Harrisville.
Cooper, J. W., Bellaire.
Diven, A. W., Martins Ferry.
Elliott, A. A., Steubenville.
Elliott, Jas. T., East Liverpool.
England, W. L., Jewett.
Erskine, E. D., Steubenville.
Fisher, B. H., Steubenville.
Floyd, J. C. M., Steubenville.
Gardner, J. W., East Liverpool.
Gregg, M., Knoxville.
Groves, A. C., Jewett.
Hanna, J. F., Adena.
Hawthorne, E. S., Colerain.
Hewettson, A. H., St. Clairsville.
Hobbs, W. A., East Liverpool.
Hobson, J. A., Flushing.
Hogan, J. M., Martins eFrry.
Hoge, W. D., Portland Station.
Holland, A. B., Wellsville.

Howells, W. O., Bridgeport.
Huston, W. O., Bellaire.
Ikirt, Geo. P., East Liverpool.
Kerns, J. T. W., Bellaire.
Korner, A. H., Alledonia.
Laughlin, R., Steubenville.
Lemmon, L. A., Calcutta.
Lindsay, J. A., Salineville.
McClellan, J. S., Bellaire.
McConnell, S. M., Wellsville.
McCoy, J. J., Steubenville.
McCullough, J. A., Steubenville.
McFarland, W. S., Wellsville.
McGavran, S. B., Cadiz.
McGlenn, J. A., Mt. Pleasant.
McMillen, W. W., Dillonvale.
Marquis, Tom B., Lisbon.
Marshall, R. J., East Liverpool.
Martin, J. W., Unionport.
Miller, J. E., Richmond.
Minor, H. C., Toronto.
Morrow, J. C., Scio.
Nelson, H. W., Steubenville.
O'Connell, W. J., Mingo Junction.
Ong, A. R., Martins Ferry.
Parke, B. F., Wellsville.
Pearce, E., Steubenville.
Purviance, J. F., Steubenville.
Rea, E. H., Dillonvale.
Rex, Park., Wellsville.
Riggs, E. N., Powhattan.
Saint, J. N., East Liverpool.
Snyder, D. J., Scio.
Spence, W. S., Germano.
Stokes, W. H., Toronto.
Thompson, W. E., St. Clairsville.
Toot, Joseph, East Liverpool.
Watt, J. M., Toronto.
West, J. P., Bellaire.
Whittaker, J. F., Bloomindgdale.
Williams, B. O., Martins Ferry.
Williams, L. O., East Liverpool.
Wood, W. H., Smithfield.
Young, J. P., Empire.

ERIE COUNTY MEDICAL SOCIETY

Auxiliary since 1877 Annual Meeting in April

Charles Graefe .....President.
J. T. Haynes.....Vice-President.
E. Stanley ..... Vice-President.
A. F. Cook.....Secretary.

MEMBERS

Bagley, Eva C.,Sandusky.
Bigelow, G. J., Sandusky.
Buckingham, E. V., Chicago Junction.
Busch, William H., Sandusky.
Burnham, R. D., Soldiers' Home.
Cook, A. F., Sandusky.
De La Bare, Paul, Port Clinton.
Gawne, A. J., Sandusky.
Goodsell, E. J., Norwalk.
Graefe, Chas., Sandusky.
Graefe, Wm., Sandusky.
Haynes, J. T., Soldiers' Home.
Heiter, Karl, Sandusky.
Hessell, A. A., Bellevue.
Hughes, F. M., Sandusky.
Kreider, C. F., Monroeville.
Love, M. J., Bloomingville.
Merrill, A. E., Sandusky.
Merz, Chas. H., Sandusky.

Osborn, A. L., Norwalk.
Perkins, C. E., Sandusky.
Quigley, R. L., Vermillion.
Race, C. W, Soldiers' Home.
Sears, O. T., Put-in-Bay.
Stanley, Ellwood, Sandusky.
Story, Wm., Castalia.
Sykes, R. D., Chicago Junction.
Tierney, Jno. Schell, Sandusky.
Van Norman, J. S., Castalia.
Waters, R. L., Lakeside.
Young, D. H., Chicago Junction.

GALLIA COUNTY MEDICAL SOCIETY

Auxiliary since 1895

E. G. Alcorn .....President.
J. Eakins ..... Vice-President.
J. B. Alcorn .....Secretary.
L. B. Turner .....Treasurer.

MEMBERS

Alcorn, E. G., Gallipolis.
Alcorn, J. B., Gallipolis.
Bean, L. C., Gallipolis.
Cromley, F. A., Gallipolis.
Dustin, J. B., Vinton.
Eakins, J., Patriot.
Ewing, G. K., Ewington.
Ely, Charles, Cheshire.
Hamilton, H. M., Vinton.
Hanson, J. T., Gallipolis.
Jacobs, R. J., Vinton.
Miller, Wm., Thurman.
Parker, C. G.. Gallipolis.
Parker, E. W., Gallipolis.
Strausbaugh, J. C., Vinton.
Turner, L. B., Bidwell.
Webster, D. J., Sand Fork.

GREENE COUNTY MEDICAL SOCIETY

Auxiliary since 1888 Annual Meeting in June

A. C. Messenger .....President.
D. E. Spahr .....Vice-President.
B. R. McClellen.....Secretary.
W. L. Rouse.....Treasurer.

MEMBERS

Anderson, Geo., Alpha.
Baldwin, J. W., Yellow Springs.
Brundage, A. H., Xenia.
Brundage, L. H., Xenia.
Brown, R. L., New Jasper.
Carter, J. L., Selma.
Donaldson, D. F., Port William.
Donaldson, Frank, Port William.
Finley, W. H., Xenia.
Galloway, C. M., Xenia.
Galloway, W. A., Xenia.
Jones, L. M., Jamestown.
Harris, J. H., Yellow Springs.
Harris, J. M., Yellow Springs.
Kent, F. M., Spring Valley.
Lindsay, F. T., Xenia.
Messenger, A. C., O. S. & S. O. Home, Xenia.
McClellen, H. R., Xenia.
McClellan, B. R., Xenia.
Marsh, M. I., Cedarville.
Murrel, Grant, New Burlington.

Marquart, O. M., Osborn.
Ogan, F. W., Jamestown.
Prior, Amelia J., Xenia.
Rouse, W. L., Paintersville.
Sewell, S. G., New Burlington.
Stewart, J. O., Cedarville.
Spahr, D. E., Clifton.
Smith, R. W., Spring Valley.
Thompson, C. W., Cedarville.
Treherne, J. M., Zimmerman.
Wilson, S. S., Xenia.

HANCOCK COUNTY MEDICAL SOCIETY

Auxiliary since 1891

N. L. McLachlan ..... President.
T. S. Wilson ..... Vice-President.
Don C. Hughes ..... Secretary.
F. B. Entrekin ..... Treasurer.

MEMBERS

Baker, J. P., Findlay.
Belt, H. D., Findlay.
Brayton, W. G., Fostoria.
Carrothers, M. M., Findlay.
Elwell, Wm., Van Buren.
Entrekin, F. B., Findlay.
Ewing, M. J., Findlay.
Firman, F. W., Findlay.
Herrington, S. G., Rawson.
Hersh, E. G., McComb.
Howell, J. A., McComb.
Hurd, A., Findlay.
Hughes, D. C., Findlay.
Kimmell, J. A., Findlay.
Lown, M. M., Findlay.
McGhee, W. C., Houcktown.
McLachlan, N. L., Findlay.
McLeod, J. R., Findlay.
Martin, J. C., Findlay.
Powell, J. E., Findlay.
Wilson, T. S., Findlay.
Williamson, M. S., Findlay.
Woods, T. E., Findlay.
Yost, W. N., Findlay.
Zopfi, W. J., Findlay.

HEMPSTEAD MEMORIAL ACADEMY OF MEDICINE

Auxiliary since 1885 Annual Meeting in May

E. M. Foster ..... President.
M. S. Pixley ..... Secretary.
D. B. Cotton ..... Treasurer.

MEMBERS

Allard, L. D., Portsmouth.
Andre, O. C., Waverly.
Berndt, A. D., Portsmouth.
Burgess, W. M., Portsmouth.
Campbell, A. D., Portsmouth.
Chabot, G. W., Otway.
Cotton, D. B., Portsmouth.
Cotton, Mary, Portsmouth.
Edwards, F. M., Portsmouth.
Foster, E. M., Portsmouth.
Frizella, J. S., Buena Vista.
Fulton, C. C., Portsmouth.
Gahm, J. L., Jackson.
Gordon, John F., Otway.

Halderman, S. S., Portsmouth.
Hall, Loren, Portsmouth.
Kline, P. J., Portsmouth.
Lottridge, W. M., Portsmouth.
McKerrichan, S. B., Portsmouth.
Marcum, L. D., Portsmouth.
Morgan, J. F., Jackson.
Osborne, G. W., Portsmouth.
Pixley, M. S., Portsmouth.
Rardin, J. S., Portsmouth.
Ray, J. B., Jr., Portsmouth.
Sellards, A. G., Portsmouth.
Smith, W. W., Portsmouth.
Taylor, James L., Wheelersburg.
Teachnor, Wells A., Sciotoville.
Titus, A., Portsmouth.
Vernier, L., Portsmouth.
Warwick, J. B., Lucasville.
Warwick, C. M., Lucasville.
Williams, J. B., Jackson.
Williams, F. H., Portsmouth.
Wiseman, J. S., Powellsville.

JACKSON COUNTY MEDICAL SOCIETY

Auxiliary since 1897

G. A. Ewing .....President.
J. H. Ray .....Vice-President.
O. M. Woodrow .....Secretary.
J. L. Gahm .....Treasurer.

MEMBERS

Darling, G. W., Wellston.
Davis, D. W., Berlin Cross R'ds.
Davis, Oscar, Oak Hill.
Drake, F. J., Leo.
Evans, W. R., Jackson.
Ewing, G. A., Jackson.
Gahm, J. L., Jackson.
Harbarger, G. H., Coalton.
Harbarger, J. W., Glen Roy.
Harrison, C. B., Wellston.
Hughes, E. E., Oak Hill.
Jacobs, Philander, Jackson.
Jones, R. J., Glen Roy.
Jones, G. E., Oak Hill.
Jones, E. J., Oak Hill.
Kitchen, B. F., Wellston.
Kinniston, Curtis, Limerick.
McLaughlin, Oscar, Remple.
Morgan, R. T., Jackson.
Morgan, J. F., Jackson.
Plummer, F. E., Coalton.
Ray, J. H., Coalton.
Ray, A. G., Byer.
Ray, E. S., Hamden Junction.
Rogers, T. C., Wellston.
Shook, J. W., Wellston.
Sylvester, J. E., Wellston.
Warren, D. B., Wellston.
Williams, W. E., Jackson.
Woodrow, O. M., Wellston.

*LAWRENCE COUNTY MEDICAL SOCIETY

Auxiliary since 1896

W. S. Eakman .....President.
J. W. Lowry .....Vice-President.
Alfred Robinson ..... Secretary.
N. K. Moxley .....Treasurer.

*Reported defunct.

MEMBERS

Clark, —, Mt. Vernon.
Clary, O. C., Ironton.
Davis, G. R., Ironton.
Eakman, W. S., Ironton.
Ellsworth, —, Rappsburg.
Fitch, —, Russell, Ky.
Gray, C. G., Ironton.
Griffith, W. S., Pedro.
Hudson, D. F., Russell, Ky.
Lowry, Clark, Ironton.
Lowry, J. W., Ironton.
Lowry, Jos. W., Ironton.
Moxley, N. K., Ironton.
Ramey, J. H., Rock Creek.
Robinson, Alfred, Ironton.
Rowan, G. W., Willow Wood.
Stewart, Dave, Arabic.
Stewart, R. S., Russell, Ky.
Wells, E. E., Ironton.
White, J. M., Ironton.
Wiseman, —, Wheelersburg.

LORAIN COUNTY MEDICAL SOCIETY

Auxiliary since 1891

S. S. Cox ..... President.
Frank Young ..... Vice-President.
E. V. Hug ..... Secretary.
E. Cameron ..... Treasurer.
A. N. Graver..... Librarian.

MEMBERS

Baumhardt, A. J., Lorain.
Beck, W. H., Vermillion.
Bunce, W. C., Oberlin.
Cameron, E., Lorain.
Campbell, A. L. D., North Amherst.
Cox, S. S., Lorain.
Foster, W., North Amherst.
Garver, A. N., Lorain.
Gilbert, J. R., Lorain.
Hoffman, W. W., Lorain.
Hug, E. V., Lorain.
Madden, J. F., Elyria.
Young, Frank, Lorain.

LUCAS COUNTY MEDICAL SOCIETY

Auxiliary since 1896

Wm. J. Gillette..... President.
C. S. Miller ..... Vice-President.
J. A. Wright ..... Recording Secretary.
Geo. F. Suker ..... Financial Secretary.
D. E. Haag ..... Treasurer.
Executive Committee—C. Storz, Ph. Strausz, M. H. Bowman.

(Members all of Toledo.)

Aftel, Gustav, 1344 Nebraska.
Alter, Frank W., 342 Summit.
Barlow, E. B., 202 E. Bancroft.
Betts, Chas., 10th and Jefferson.
Bowman, D. E., Air Line Jct.
Bowman, M. H., Ashland and Floyd.
Brewer, L. A., 602 Virginia.

Burke, Wm. T., 47 Ontario.
Clark, D. J., 532 Galena.
Clark, J. F., 411 Michigan.
Emery, Geo., Cherry and Erie.
Fella, J. F., 603 S. St. Clair.
Gillette, W. J., 705 Madison.
Girardot, A. J., 1408 Cherry.
Haag, D. E., 1121 Washington.
Hall, Harry L., "The Monticello."
Harpster, C. M., 342 Summit.
Heltman, E. W., Summit and Madison.
Henzler, C. J., Bancroft, cor. Cherry.
Hobart, A. D., 500 Oak.
Howe, J. D., Vermont Ave.
Jacobson, Julius, Franklin Av.
Jerome, M., East Bancroft St.
Jump, H. M., Plymouth St.
Kimbell, O. W., 3111 Lagrange.
Kitchen, F. A., 2133 Jefferson.
Lockard, L. B., 914 Jefferson.
McVety, Albert, 1440 Madison.
Marshall, Dyer M., 147 Main.
Miller, C. S., 2424 Cherry.
Mills, C. H., 204 Fassett.
Minton, F. P., Valentine and Whitmore.
Munn, H. E., 960 Broadway.
Newton, C. W., 309 Superior.
Noble, H. E., 440 E. Broadway.
Norris, W. Lee, 2123 Ashland.
North, John, Currier Bldg.
Rieg, Phillip, 338 Summit.
Schutt, L. C., 529 Mulberry.
Smead, Herbert E., 3131 Glenwood.
Snyder, W. H., 912 Jefferson.
Storz, Christian, 404 Nebraska.
Strausz, Philip H., Oakwood Av.
Suker, George F., The Monticello.
Timpany, Robt., Cherry and Bancroft.
Thorn, S. S., Lagrange and Superior.
Waddick, James M., St. Clair St.
Walker, R. J., 637 Bridge.
Watson, J. L., Fulton and Prescott.
Wickham, Wm., Superior and Adams.
Woods, J. T., Jefferson and Summit.
Wright, J. A., 1814 Cherry.
Young, Nelson H., 321 Superior.

MAHONING COUNTY MEDICAL SOCIETY

Auxiliary since 1879 — Annual Meeting in October

Harry E. Welch ..... President.
Lebanon U. Howard ..... Vice-President.
Raymond E. Whelan ..... Secretary.
Robert D. Gibson ..... Treasurer.
George S. Peck ..... Librarian.
Censors—John J. Thomas, John MacCurdy, Arthur Winter.

MEMBERS

Arner, W. P., Fowler, O.
Barnes, R. H., Youngstown.
Beach, A. M., Niles.
Bennett, J. H., Youngstown.
Blott, H. E., Youngstown.
Booth, C. C., Youngstown.

Buechner, W. H., Youngstown.
Campbell, Daniel, Canfield.
Clark, A. M., Youngstown.
Clarke, Ida, Youngstown.
Clark, M. S., Youngstown.
Cone, J. E., Youngstown.
Crooks, J. H., Youngstown.
Dickson, J. A., Youngstown.
Floor, C. L., Youngstown.
Gibson, R. D., Youngstown.
Hahn, H. H., Youngstown.
Hauser, Chas., Youngstown.
Howard, L. U., Youngstown.
King, A. L., Youngstown.
Kotheimer, J. B., Youngstown.
Love, Wm. P., Youngstown.
MacCurdy, John, Youngstown.
Montgomery, R. H., Youngstown.
Morrison, R. M., Youngstown.
Peck, G. S., Youngstown.
Thomas, J. J., Youngstown.
Vogan, J. E., Lowellville.
Warren, A. E., Youngstown.
Welch, H. E., Youngstown.
Werner, W. E., Austintown.
Whelan, R. E., Youngstown.
Whelan, W. J., Youngstown.
Wilson, A. C., Youngstown.
Winter, Arthur, Youngstown.
Woodbridge, J. E., Chicago, Ill.
Yost, J. O., Youngstown.
Zimmerman, H. A., Youngstown.
Zimmerman, J. S., Youngstown.

MANSFIELD ACADEMY OF MEDICINE

Auxiliary since 1897

A. J. Erwin ..... President.
J. L. Stevens ..... Secretary.

MEMBERS

Bowles, R. S.
Bushnell, William.
Davis, M. J.
Erwin, A. J.
Finley, Mary J.
Grubaugh, R. F.
Harding, B. F.
Harris, C. Jenner.
Hedges, J. S.
Kipp, A. E.
Loughridge, William.
McArthur, J. A.
McBride, J. Lillian.
McCullough, A. H.
Maglott, John.
Mitchell, George.
Race, Charles.
Schambs, J. F.
Stevens, J. L.
Wiles, Otis.

MARION COUNTY MEDICAL SOCIETY

Auxiliary since 1879 Annual Meeting in January

J. I. King ..... President.
A. Ogan ..... Vice-President.
R. Ramroth ..... Secretary.
O. W. Weeks ..... Treasurer.

MEMBERS

Britton, S. H., Adelaide.
Chisholm, Horatio, Marion.
Crane, A. M., Marion.
Denman, Wm. C., Marion.
Dombaugh, Robert S., Waldo.
Hamilton, L. D., Marion.
King, J. I., Martel.
McMurray, Jas. W., Marion.
Martin, Jno. T., Marion.
Ogan, A., Marion.
Ramroth, R., Marion.
Rhu, August, Marion.
Richardson, E. O., Marion.
Thomas, F. W., Marion.
Uhler, H. L., Marion.
Virden, J. E., Cochranton.
Weeks, D. O., Marion.
Weeks, O. W., Marion.

MEIGS COUNTY MEDICAL SOCIETY

Auxiliary since 1850 — Annual Meeting in October

C. R. Reed ..... President.
C. W. Petty ..... 1st Vice-President.
L. A. Thomas ..... 2d Vice-President.
D. Sisson ..... Secretary.

MEMBERS

Barton, T. H., Syracuse.
Beane, George, Rutland.
Day, C. S., Harrisonville.
Deem, S. P., Tuppers Plains.
Hartinger, D. B., Middleport.
Hoff, J. W., Pomeroy.
Holmes, A. F., Albany.
Hysell, J. H., Pomeroy.
Martin, W. H., Chester.
Miller, J. A., Pomeroy.
Mullen, E., Pomeroy.
Petty, C. W., Hartford City, W. Va.
Poindexter, Charles, Dexter.
Reed, C. R., Middleport.
Rine, E. W., Long Bottom.
Rothburn, D. C., Middleport.
Roush, L. F., New Haven, W. Va.
Sayer, D. A., Hartford City, W. Va.
Sisson, D., Middleport.
Stanley, A. A., Rutland.
Stobart, R. E., Pomeroy.
Thomas, L. A., Middleport.
Titus, J. M., Letart Falls.
Williams, Alice D., Syracuse.

MIAMI COUNTY MEDICAL SOCIETY

H. D. Rhinehart ..... President.
S. D. Hartman ..... Vice-President.
W. Coleman ..... Secretary.
J. H. Lowe..... Corresponding Secretary and Treasurer.

MEMBERS

Ashton, A. S., Piqua.
Baker, J. H., Piqua.
Bausman, J. W., Pleasant Hill.
Bausman, A. J., Pleasant Hill.
Coleman, W., Troy.
Counts, Charles, Troy.
Deaton, Van S., Alcony.
Eagle, P. F., Troy.
Evans, J. R., Troy.
French, E. H., Piqua.
Frame, A., Piqua.
Funderburg, J. F., Piqua.
Gabriel, J. F., Piqua.
Grosvenor, A. W., Piqua.
Green, J. H., Troy.
Hall, J. A., Troy.
Havens, H. H., Tippecanoe City.
Hartman, S. D., Tippecanoe City.
Jennings, G., West Milton.
Kessler, W. H., West Milton.
King, —, Piqua.
Kitzmiller, F. E., Piqua.
Lindenberger, L. M., Troy.
Lowe, J. H., Piqua.
Meeks, I. S., Troy.
Miller, A. C., Covington.
O'Ferrall, R. M., Piqua.
Pearson, H., West Milton.
Reck, L. E., Piqua.
Rhinehart, H. D., Covington.
Senior, J. G., Troy.
Shannon, R. M., Piqua.
Shellenberger, J. E., Piqua.
Snorf, P. L., Piqua.
Thompson, W. R., Troy.
Tydings, O., Piqua.
Unkefer, W. H., Piqua.
Widmer, W. E., Tippecanoe City.
Wright, Thos. M., Troy.

MONTGOMERY COUNTY MEDICAL SOCIETY

Auxiliary since 1851 — Annual Meeting in January

D. C. Huffman ..... President.
F. C. Gray ..... Vice-President.
Frank Fife ..... Secretary.
C. H. Humphreys ..... Treasurer.
Censors—Drs. Bonner, Goodhue and Beck.

MEMBERS

Adams, P. N., Dayton.
Bailey, V. M., Dayton.
Baker, E. R., Dayton.
Barrere, D. M., Dayton.
Bates, Albert I., Dayton.
Beck, J. S., Dayton.
Bonner, Horace, Dayton.
Boone, A., Dayton.
Conklin, W. J., Dayton.
Corbin, Lee, Dayton.
Crum, E. C., Dayton.
Davisson, E. C., Dayton.
Dolina, J. F., Dayton.
Duckwal, Francis, Dayton.
Dupuy, T. V., Dayton.
Ellis, S. B., Dayton.
Evans, Geo. B., Dayton.
Fife, Frank, Dayton.
Gangler, R. S., Dayton.
Geyer, John, Dayton.
Good, Harman, Dayton.
Goodhue, Geo., Dayton.

Gray, F. C., Dayton.
Greene, D. W., Dayton.
Hatcher, H. H., Dayton.
Hecker, L. E., Dayton.
House, G. W., Clayton.
Huffman, D. C., Dayton.
Humphreys, C. H., Dayton.
Iddings, A. H., Dayton.
Jenner, H. G., Dayton.
Jewett, H. S., Dayton.
Judy, C. S., Miamisburg.
Keever, D., Centerville.
Kimmel, H. S., Dayton.
King, C. W., Dayton.
Krause, L. S., West Carrollton.
Lichliter, D. C., Dayton.
MacGregor, Chas., Dayton.
Marshal, W. C., Dayton.
Moist, A. R., Dayton.
Myers, G. A., Dayton.
Pettit, R. R., Dayton.
Plattfont, Wm., Dayton.
Rattliff, J. M., Dayton.
Reeves, J. C., Jr., Dayton.
Reilly, D. G., Dayton.
Saunders, Samuel, Dean P. O.
Scheibenzuber, D. A., Dayton.
Smith, Webster A., Dayton.
Stein, E. H. R., Dayton.
Weaver, J. M., Dayton.
Weaver, W. P., Miamisburg.
Williamson, A. M., Dayton.

MORROW COUNTY MEDICAL SOCIETY

Auxiliary 1897

H. S. Green .....President.
A. D. James.....1st Vice-President.
G. W. Morehouse .....2d Vice-President.
F. C. Griffis .....Secretary.
J. W. Wood .....Treasurer.
Honorary Members—J. F. Baldwin, Columbus; J. E. Brown, Columbus; A. M. Duncan, Bucyrus; W. Hamilton, Columbus; D. N. Kinsman, Columbus; F. C. Larimore, Mt. Vernon; W. J. Means, Columbus; R. H. Reed, Rock Springs, Wyo.; Aug. Rhu, Marion; G. M. Waters, Columbus.

MEMBERS

Bennett, W. C., Mt. Gilead.
Borden, A. L., Iberia.
Buck, A. H., Marits.
Dunham, C. C., Fulton.
Green, H. S., Cardington.
Griffis, F. C., Mt. Gilead.
James, A. D., Mt. Gilead.
Mateer, R. V., Mt. Gilead.
Moore, V. O., Sparta.
Morehouse, G. W., Sparta.
Neal, C. H., Cardington.
Pierce, R. L., Whitstone.
Sherman, E. C., Bennington.
Spear, R. C., Mt. Gilead.
Thompson, F. E., Marengo.
Virtue, D. B., Mt. Gilead.
Warmeling, C. T., Cardington.
Welch, Ella, Ashley.
Williams, J. W., Chesterville.
Wood, J. W., Mt. Gilead.

MUSKINGUM COUNTY MEDICAL SOCIETY

Auxiliary since 1894

Edward Cass ..... President.
W. A. Melick .....Vice-President.
Anna M. Hill ..... Secretary and Treasurer.

MEMBERS

Axline, C. Z., Fultonham.
Axline, F. A., Fultonham.
Bainter, M. R., Cambridge.
Bainter, R. B., Adamsville.
Bateman, W. C., Zanesville.
Cass, Edward, Dresden.
Chapplear, H. C., Hopewell.
Crider, C. C., Zanesville.
Davis, J. T., Zanesville.
Fassig, J. M., Zanesville.
Fleming, J. D., Frazersburg.
Geyer, J. L., Norwich.
Geyer, H. R., Zanesville.
Haldeman, J. S., Zanesville.
Hanna, C. U., Zanesville.
Harris, H. M., Zanesville.
Hawk, Philip W., Zanesville.
Henderson, P. P., Zanesville.
Hill, Anna M., Zanesville.
Holden, J. L., Zanesville.
Holston, J. G. F., Zanesville.
Hosick, W. R., Adamsville.
Kelley, S.. Zanesville.
King, F. J., Hoople, N. Dak.
Lane, G. W., Sago.
Leeper, J. L., Rural Dale.
Logsdon, E. C., Zanesville.
McCreary, H. M., New Concord.
Mathews, D. J., Zanesville.
Melick, John, Gratiot.
Melick, W. A., Zanesville.
Nye, H. S., Zanesville.
Peabody, Anna, Zanesville.
Prout, G. B., Dillon.
Rambo, C. M., Zanesville.
Sellers, C. P., Zanesville.
Sheppard, H. J., Zanesville.
Squires, A. W., White Cottage.
Sutton, H. T., Zanesville.
Templeton, A. M., Zanesville.
Templeton, B. F., Zanesville.
Warburton, G., Zanesville.
White, J. A., New Concord.

NORTH CENTRAL OHIO MEDICAL SOCIETY

Auxiliary since 1881 Annual Meeting in March

Wm. E. Lougridge..... .....President.
A. F. Hyde .....Vice-President.
J. Lillian McBride ..... Secretary.
A. H. McCullough .....Treasurer.

MEMBERS

Anderson, M., Shelby.
Ash, L. B., Ashland.
Baughman, G. W., Mansfield.
Bertolette, H. B., Shreve.
Boles, R. S., Mansfield.
Chisholm, H., Marion.
Crane, A. M., Marion.
Crile, G. W., Cleveland.

Culler, J. F., Lucas.
Davis, M. J., Mansfield.
Denman, W. C., Marion.
Eastman, N. R., Bellville.
Erwin, A. J., Mansfield.
Findlay, S. E., Mansfield.
Finley, M. J., Mansfield.
Gone, M. F., Shelby.
Grubaugh, R. F., Mansfield.
Hall, B. O., Richwood.
Harding, B. F., Mansfield.
Harris, C. Jenner, Mansfield.
Huffman, O. L., Galion.
Hyde, A. F., Shelby.
Kendig, E. V., Hayesville.
King, J. I., Martel.
Kipp, A., Mansfield.
Larimore, F. C., Mt. Vernon.
Loughridge, W. E., Mansfield.
Maglott, John, Mansfield.
McCullough, A. H., Mansfield.
McMillan, D. C., Mansfield.
McArthur, J. A., Mansfield.
McBride, J. Lillian, Mansfield.
McNaul, John, Mansfield.
McMurray, A. B., Marion.
Myers, J. A., Shelby.
Nichols, J. H., Mansfield.
Potter, L. B., Fredericktown.
Race, C. W., Sandusky Soldiers' Home.
Rhu, August, President.
Roebuck, L. L., Richwood.
Roush, Frances A., Shelby.
Sattler, G. P., Mansfield.
Smith, H. H., Lexington.
Stevens, J. L., Mansfield.
Sykes, W. H., Plymouth.
Thomas, F. W., Marion.
Trimble, C. E., Crestline.
Tucker, G. W., Mansfield.
Uhler, A. P., Marion.
Wells, J., Marion.

NORTHWESTERN OHIO MEDICAL ASSOCIATION

Auxiliary since 1869 — Annual Meeting in December

James A. Duncan ..... President.
J. A. Kimmell ..... Vice-President.
W. S. Powell ..... Vice-President.
J. P. Baker ..... Secretary.
T. M. Gehrett ..... Asst. Secretary and Treasurer.

MEMBERS

Anderson, W. V., Toledo.
Archer, J. D., Holgate.
Archer, J. R., North Baltimore.
Aris, James, Toledo.
Ashton, E., Lima.
Alford, N. E., Leipsic.
Babcock, H. D., South Toledo.
Bain, F. D., Kenton.
Baker, J. P., Findlay.
Baldwin, F. J., Bluffton.
Banning J. C., Belle Centre.
Barrington, D., Rocky Ridge.
Bates, F. L., Lima.
Bolman, C. F., Coldwater.
Bowen, A. D. West Lodi.
Brown, H. H., Fulton County.
Baxter, S. A., Lima.
Beaghler, A. C., Middle Point.
Beardsley, C. E., Ottawa.
Beardsley, C. O., Ottawa.

Becker, Bernhardt, Toledo.
Beckwith, S. W., Toledo.
Begg, W. H., Columbus Grove.
Belt, W. A., Kenton.
Benner, C. T., Tiffin.
Berlin, C., Wapakoneta.
Bessey, J. M., Toledo.
Bird, S. H., Dupont.
Bishop, S. P., Delta.
Binder, Albert, Ottoville.
Beleau, Nettie, Defiance.
Blaine, H. G., Toledo.
Blaine, S. P., Toledo.
Bland, J., Bucyrus.
Bloomfield, John, Napoleon.
Bodman, L. H., Toledo.
Bond, J. W., Toledo.
Bowers, I. S., Perrysburg.
Bowen, Geo. W., Toledo.
Bowman, J. L., Coldwater.
Brattain, G. E., Payne.
Brayton, A., Carey.
Brayton, W. G., Fostoria.
Bricker, J. W., Fostoria.
Brigham, O. S., Toledo.
Brinkerhoff, D. H., Fremont.
Brooks, P. H., Lima.
Brunthaver, Frank, Maumee.
Borman, Adam, Glandorf.
Bralton, W. E., Payne.
Burritt, W. H., South Toledo.
Burton, E. G., Westminster.
Busch, Wm., Sandusky.
Byal, W. A., Findlay.
Coombs, J. M., Defiance.
Calvin, J. H., Huron.
Campbell, L. W., Ada.
Carrothers, M. M., Findlay.
Cessna, B. F., Kenton.
Chamberlin, D. P., Toledo.
Chapman, W. C., Toledo.
Cherry, Wm., Toledo.
Chesney, J. A., Bucyrus.
Chesney, J. M., Marseilles.
Chilcote, C. H., Bloomdale.
Clark, J. R., Bluffton.
Clevenger, R. E., North Washington.
Carey, M. J., Woodville.
Coy, M. C., Defiance.
Cook, Henry, Hicksville.
Cameron, Robert, Jewell.
Campbell, C. S., Tedrow.
Clippinger, J. S., West Cairo.
Cole, C. S., Toledo.
Cole, W. C., Rockford.
Collamore, Geo. A., Toledo.
Cosgrave, Thomas, Toledo.
Cramer, W. S., Ohio City.
Craver, Belle, Toledo.
Crooks, R. L., Convoy.
Curry, John H., Toledo.
Curtis, C. L., Lima.
Cole, C. B., Grand Rapids.
Davis, John, Gomer.
Davis, Samuel, Waterville.
Day, H. M., Pandora.
Demer, H. E., Castalia.
DeVilbiss, Allen, Toledo.
Dine, C. L., Minster.
Dickey, W. A., Tiffin.
Dimoke, Eli, Dupont.
Dix, S. E., Van Wert.
Donnelly, James, Toledo.
Duncan, James A., Toledo.
Durbin, R. M., Woodville.
Eakin, T. E., Columbus Grove.
Evans, J. B., Ada.
Ewing, Frank, West Cairo.
Ewing, M. Jay, Findlay.
Entrikin, F. B., Findlay.
Faber, C. A., Toledo.
Files, C. A., Van Wert.
Firmin, F. W Findlay,

Fisher, A. W., Toledo.
Fisher, W. H., Toledo.
Foltz, T. H., Lima.
Forbes, S. F., Toledo.
Finch, R. W., Defiance.
Gardiner, W. G., Toledo.
Gardner, John, Toledo.
Gehrett, T. M., Deshler.
George E., Van Buren.
Gibbon, H. B., Tiffin.
Gillette, W., Toledo.
Glenn, L. C., Kenton.
Glenn, Mrs. G. C., Van Wert.
Godfrey, C. M., Ottawa.
Goebel, Anna M., Lima.
Graefe, Charles, Sandusky.
Green, C. S., Fostoria.
Guise, J. M., Findlay.
Guise, P. O., Findlay.
Good, H., Columbus Grove.
Greenfield, Edgar J., Haskins.
Haines, J. B., Beaver Dam.
Haynes, T., Sandusky.
Haley, J. S., Napoleon.
Hamilton, H. A., Perrysburg.
Harper, W. H., Lima.
Harrison, E. B., Napoleon.
Hartman, G. W., Wauseon.
Hasencamp, O. H., Toledo.
Hathaway, H., Toledo.
Hattery, J. E., Celina.
Havighorst, H. S., Toledo.
Heard, E. N., Sandusky.
Heckerman, J. U., Tiffin.
Hedrick, J. S., Dunkirk.
Heistand, E. B., Kenton.
Heller, F. S., Oak Harbor.
Heller, J., Grand Rapids.
Henderson, Geo. H., Vaughnsville.
Henry, A. G., North Baltimore.
Heller, Thos. F., New Washington.
Harmon, C. E., Delphos.
Heaton, C. A., McCutchinsville.
Herrmann, S. S., Lima.
Hersh, E. G., McComb.
Hickey, W. H., Leipsic.
Higbie, J. L., Jenera.
Hill, W. W., Weston.
Hines, J. A., Van Wert.
Hiner, S. B., Lima.
Hixon, M. M., Dupont.
Haag, Harry P., Liberty Center.
Hoag, D. E., Liberty Center.
Hoege, George L., Fostoria.
Hover, W. E., Lima.
Howell, J. A., McComb.
Hubbard, Thomas, Toledo.
Huber, H., Ottawa.
Huntley, J. H., Lima.
Hurd, A., Findlay.
Hitchcock, S. A., Elida.
Imhoff, C. E., Belmore.
Jenner, A. B., Arlington.
Jewell, N. W., Wauseon.
Jones, C. P., Nevada.
Jones, H. W., Van Wert.
Jones, R. E., Gomer.
Jones, W. A., Antwerp.
Kahle, A. W., Lima.
Kahle, R. D., Lima.
Keller, T. F., Tiffin.
Kishler, W. G., St. Marys.
Kimmont, T. C., Hicksville.
Kirkley, C. A., Toledo.
Kitchen, F. A., Toledo.
Kimmell, J. A., Findlay.
Lathrop, A. B., Swanton.
Leever, J. C., Eaton.
Lusk, S. B., Waynesfield.
Lisle, J. M., Columbus.
Ladd, L. E., Middle Point.
Lander, W. L., North Baltimore.
Lawdick, L. F., Lima.
Landman, Otto, Toledo.

Lawless, J. T., Toledo.
Lenhart, P. J., Wauseon.
Leonard, B. B., West Liberty.
Leonard, B. S., West Liberty.
Levan, D. H., Mt. Victory.
Light, Frank, Ottawa.
Long, J. W., Bryan.
Longfellow, A. J., Fostoria.
Longsworth, W. N., Van Wert.
Lynch, Wm., Greenville.
McClung, J. C., Leipsic.
McCoy, Clenn D., Kenon.
Morris, Frank, Columbus Grove.
McLachlin, N. L., Findlay.
McConnell, D. W., Findlay.
McCullon, E. J., Tiffin.
McGavren, G. W., Van Wert.
McIlvane, W. H., Kenton.
McKeller, A. P., Green Spring.
McKinley, E. B., Vaughnsville.
McLaughlin, C. C., Dunkirk.
McLeod, J. R., Findlay.
McMillen, Alex., Genoa.
Maerker, A. E. H., Napoleon.
Manville, A. J., Bowling Green.
Martin, J. C., Findlay.
Mauk, E. B., Delphos.
Merz, Chas. H., Sandusky.
Meyers, A. H., Carey.
Miller, C. S., Toledo.
Miller, James M., Menden.
Miller, W. L., Findlay.
Marsh, J. M., Delphos.
Matteson, D. E., Lima.
Mills, C. H., Toledo.
Montgomery, W. H., Paulding.
Morgan, R. J., Van Wert.
Morris, Joseph, Columbus Grove.
Mumaugh, Shelby, Lima.
Munn, H. E., Toledo.
Munson, A. W., Kenton.
Murback, A. J., Archbald.
Neville, W. S., Roundhead.
Newman, J. E., Gilboa.
Noble, H. E., Stoney Ridge.
Noble, J. G., Toledo.
Noble, Nathan T., St. Marys.
Nolen, J. G., Toledo.
Norris, M. M., Fostoria.
North, John, Toledo.
Nuding, W. H., Botkins.
Norris, O. L., Deshler.
Perkins, C. E., Sandusky.
Paul, T. E., Ottawa.
Pence, Leroy, Celina.
Phelps, C. H., St. Marys.
Philips, D. P., Kenton.
Philips, W. S., Belle Centre.
Pollock, S. J., New Hampshire.
Pontius, C. R., Fremont.
Potts, Charles N., Lima.
Pugh, F. H., Bryan.
Powell, J. E., Findlay.
Powell, W. S., Defiance.
Radebaugh, P., Celina.
Reed, C. H., Toledo.
Reed, E. J., Leipsic.
Reid, Charles, Continental.
Reid, C. B., Van Wert.
Reid, J. L., Van Wert.
Reiff, Charles T., Fremont.
Reinfrank, J. H., Perrysburg.
Ramsbottom, J. J., Wabash.
Reynolds, J. J., Defiance.
Reinhart, J. C., Toledo.
Remeker, A. P., Maria Stein.
Rhu, Auguste, Marion.
Rice, Robert H., Fremont.
Richardson, D. H., Celina.
Richardson, E. O., Bowling Green.
Richardson, J. V., Ft. Recovery.
Ritchey, J. A., Oceola.
Rogers, J. A., Kenton.

Root, H. A., Toledo.
Rudy, A. S., Lima.
Rush, D., Celina.
Robinson, F. B., Chicago.
Sager, Joseph, Celina.
Sager, N., Jr., Herring.
Schlink, F. H., New Reigel.
Sexauer, C. F., North Robinson.
Shaffner, J. T., Willshire.
Smart, A. R., Toledo.
Sherrard, A. C., Broughton.
Shnetzler, H. M., Toledo.
Skinner, S. W., Toledo.
Slager, J. L., Paulding.
Small, W. W., Van Wert.
Smalley, W. M., Ohio City.
Smith, C. H., Kenton.
Smith, C. N., Toledo.
Smith, D. C., Dunkirk.
Smith, Wm., Van Wert.
Smith, W. M., Van Wert.
Snodgrass, Jesse, Kenton.
Souder, R. L., Nevada.
Speece, N. V., Quincy.
Stamm, M., Fremont.
Stancell, J. A., Forest.
Steiner, D. W., Lima.
Stemen, H. G., Delphos.
Stemen, W. E., Van Wert.
Stewart, J. M., Oak Harbor.
Stewart, W. D., Toledo.
Stevens, M. B., Defiance.
Steuber, F. G., Lima.
Steuber, L. J., Lima.
Stutsman, J. M., Van Wert.
Swimley, W. A., Forest.
Terwilliger, T. R., Lima.
Thacker, L. G., Defiance.
Thomas, O. H., Fremont.
Thomson, J. C., Rollersville.
Thorn, S. S., Toledo.
Thrift, J. T., Columbus Grove.
Tobey, H. A., Toledo.
Todd, F. A., Toledo.
Tracy, J. L., Millbury.
Tracy, J. L., Toledo.
Trovinger, John R., Arlington.
Tuller, W. M., Bowling Green.
Tuttle, S. S., Van Wert.
Van Note, W. B., Lima.
Vail, J. B., Lima.
Van Pelt, C. L., Toledo.
Virtue, L. M., Sulphur Springs.
Waddick, J. M., Toledo.
Wagar, Chas. P., Toledo.
Wagoner, H. P., Delphos.
Walker, R. G., Toledo.
Walters, J. W., Ada.
Ward, E. L., Cridersville.
Waters, R. T., Lakeside.
Weaver, Philip, Coldwater.
Westrick, J. D., Defiance.
Weadock, T. M., Lima.
Wegg, John A., Oak Harbor.
Wert, L. J., Benton.
West, M. O., Mexico.
West, T. J., Tiffin.
Wetherill, I. R., Bluffton.
Wilkins, J. A., Delta.
Wilkinson, E. L., Van Wert.
Willett, P., Elmore.
Willett, R. A., Elmore.
Williard, G. P., Tiffin.
Williams, F. S., Kalida.
Williamson, M. S., Findlay.
Wilson, S. R., Celina.
Wilson, W. P., Findlay.
Wintermute, J. G. C., Celina.
Winders, Frank, Columbus.
Windisch, John S., Port Clinton.
Wilson, Therow, Findlay.
Wood, W. I., Medina.
Woods, J. K., Van Wert.
Woods, J. T., Toledo.

Woods, Thos. E., Findlay.
Wordsworth, Miner, Hoytsville.
Woodward, George, Oak Harbor.
Wright, John A., Toledo.
Wright, James B., Convoy.
Yingling, George S., Tiffin.
Yoder, S. S., Lima.
Yost, W. M., Findlay.
Young, P. B., Crestline.
Zebald, A. M., Hector.
Zedlitz, Arne, Toledo.
Zigler, H. H., Ayresville.
Zopfi, W. J., Findlay.

PERRY COUNTY MEDICAL SOCIETY

Auxiliary since 1897

C. B. Holcomb ..... President.
J. D. Hayes ..... Vice-President.
J. G. McDougal ..... Secretary-Treasurer.

MEMBERS

Axline, J. D., Shawnee.
Aurand, H. C., Dumontville.
Barnes, B. F., Hemlock.
Barrow, C. A., New Straitsville.
Book, R. D., Corning.
Callinan, D. F., Corning.
Clemson, G. W., Thornville.
Clouse, Lewis, Somerset.
Davis, J. I. Shawnee.
Dennison, J. M., Blatchford.
Dupler, W. P., Crooksville.
Essington, U. K., Readington.
Folk, P., Deavertown.
Gordan, P. A., Junction City.
Hayes, J. D., Somerset.
Holcomb, C. B., Corning.
Hutchfield, John, Moxahala.
Kennedy, G. L., Deavertown.
Lewis, W. G., Rushville.
Longstreth, W. E., Comly.
McDougal, J. G., New Lexington.
McTeague, N. T., New Lexington.
Moody, I. A., Junction City.
Norman, O. M., Roseville.
O'Farrell, M., Shawnee.
Richards, A., New Lexington.
Richards, R. L., New Lexington.
Sessoms, J. S., Rendville.
Thomas, B. A., Rushville.
Trout, G. B., Dillon.
Walker, G. W., Roseville.
Winters, B. E., New Straitsville.
Wright, J. H., New Lexington.

PICKAWAY COUNTY MEDICAL SOCIETY

Auxiliary since 1897

C. D. Briner ..... President.
O. H. Dunton ..... Vice-President.
Geo. W. Heffner ..... Secretary.
Thos. Blackstone ..... Treasurer.

MEMBERS

Allen, H. C., Circleville.
Blackstone, Thos., Circleville.
Briner, C. D., Williamsport.
Blacker, Chas. E., S. Bloomfield.
Courtright, D. V., Circleville.
Dunton, O. H., Circleville.
Hammel, M. H., Circleville.
Hatfield, C. C., Kingstown.
Heffner, Geo. W., Circleville.
Holman, A. W., Circleville.
Irwin, Samuel J., Tarlton.
Jones, Howard, Circleville.
Miller, J. E., Darbyville.
Miessie, M. H., Circleville.
Row, Geo. T., Circleville.
Shaeffer, A. H., Circleville.
Tipton, T. C., Williamsport.
Wright, T. B., Circleville.

PIKE COUNTY MEDICAL SOCIETY

Auxiliary since 1894

W. S. Jones ..... President.
E. M. Dixon ..... Vice-President.
E. O. S. Brown ..... Secretary.
E. W. Tidd ..... Treasurer.
Board Censors—J. B. Ray, O. J. S. Hunter, O. C. H. Wilson.

MEMBERS

Allard, L. D., Portsmouth.
Andre, O. C., Waverly.
Brown, E. O. S., Beaver.
Bumgarner, A. E., Piketon.
Caldwell, L. L., Waverly.
Dixon, E. M., Flat.
Heath, J. R., Omega.
Hooper, W. H., Waverly.
Hunter, J. S., Piketon.
Hutt, Austin, Waverly.
Jones, W. S., Waverly.
Obrist, J. W., Beaver.
Ray, Dr. J. B., Omega.
Samson, W. S., Flat.
Samson, H. M., Laurelville.
Tidd, E. W., Wakefield.
Willson, C. H., Idaho.
Windle, S. E., Latham.

PORTAGE COUNTY MEDICAL SOCIETY

Auxiliary since 1869 — Annual Meeting in June

J. J. Orton ..... President.
Geo. J. Waggoner ..... Secretary.

MEMBERS

Applegate, F. C., Windham.
Bietz, A. J., Ravenna.
Davis, J. D., Kent.
French, G. R., Mantua.
Hannum, E. S., Mantua.
Hiddleson, C. S., Atwater Sta.
Krape, J. H., Kent.
Leonard, C. S., Ravenna.
Orton, J. J., Randolph.
Page, H. M., Hiram.
Price, E. W., Kent.
Proctor, G. M., Shalersville.
Sloan, S. L., Ravenna.
Spiers, H. H., Ravenna.
Smith, W. G., Ravenna.
Snow, C. A., Garrettsville.
Shank, J. W., Windham.
Waggoner, Geo. J., Ravenna.

ROSS COUNTY MEDICAL SOCIETY

Auxiliary since 1876 — Annual Meeting in April

J. W. Lash ..... President.
F. M. Smallwood ..... Secretary.

MEMBERS

Cole, A. P., Chillicothe.
Evans, J. M., Clarksburg.
Evans, T. W., Richmond Dale.
Franklin, G. S., Chillicothe.
Galbreath, E. J., Chillicothe.
Gorslene, G. L., Chillicothe.
Hall, R. B., Cincinnati.
Hall, W. A., Chillicothe.
Hanley, J. M., Chillicothe.
Jones, J., Omega.
Lash, F. W., Chillicothe.
Leslie, J. M., Chillicothe.
Lightner, S. C., Hallsville.
McKee, R. H., Bainbridge.
Maggenhoffen, E., Chillicothe.
Matthews, J. M., Clarksburg.
Meisse, Charles, Chillicothe.
Meisse, B. F., Chillicothe.
Moore, W. E., Chillicothe.
Morgan, J. B. F., Clarksburg.
Pancake, Isaac, Jr., Frankfort.
Pricer, W. B., Thornton.
Reedy, C., Kingston.
Robinson, R. D., Hallsville.
Robbens, G. E., Chillicothe.
Robb, H. H., Frankfort.
Scott, H., Chillicothe.
Scott, W. S., Chillicothe.
Schmausser, C. E., Chillicothe.
Smith, W. A., Chillicothe.
Smallwood, E. H., Chillicothe.
Smallwood, F. M., Chillicothe.
Van Winkle, J. A., Bourneville.
Wiltshire, J. M., Gillespieville.
Wiltshire, J. S., Gillespieville.

SHELBY COUNTY MEDICAL SOCIETY

Auxiliary since 1852 — Annual Meeting in December

M. F. Hussey ..... President.
Wm. Milholland ..... Vice-President.
J. W. Costolo ..... Secretary.
J. M. Carter ..... Treasurer.

MEMBERS

Beeman, P., Carey's Mills.
Cable, T. B., Pemberton.
Carter, J. M., Jackson Centre.
Caywood, J. E., Lockington.
Costolo, J. W., Sidney.
Dine, C. L., Minster.
Geyer, J. D., Sidney.
Hamsher, J. F., Palestine.
Harbour, C. W. B., Anna.
Holopeter, J. S., Houston
Hussey, M. F., Sidney.
Johnston, C. E., Sidney.
McBurney, Ed., Jackson.
Milholland, Wm., Sidney.
Miller, J. F., Port Jefferson.
Moots, C. W., Jackson Center.
Sharpe, B. M., Sidney.
Silver, D. R., Sidney.
Smith, M. O., Hardin.
Tate, G. M., Botkins.
Yates, E. A., Kirkwood.

STARK COUNTY ACADEMY OF MEDICINE

Auxiliary since 1897

H. E. Corl .....President.
J. P. DeWitt .....Corresponding Secretary.
R. J. Pumphrey .....Recording Secretary.

MEMBERS

Barnes, H. F., Canton.
Barnes, S. S. P., Massillon.
Baker, W. O., Lewisville.
Biechele, R. A., Canton.
Burns, Katharine, Canton.
Becker, W. H., North Industry.
Bye, J. M., Canton.
Campbell, A. B., Canal Fulton.
Corl, H. E., Middlebranch.
Conklin, S. A., Canton.
Culbertson, N. W., Massillon.
DeWitt, J. P., Canton.
Exline, C. E., Canton.
Foulks, M. C., Canton.
Foulks, W. S., Canton.
Fraunfelter, J., Canton.
Goodrich, C. H., Sandyville.
Hart, H. E., Canton.
Hudson, J. F., Canton.
Klingensmith, J. B., Pierce.
Lichty, M. J., Alliance.
March, E. J., Canton.
Marchand, J. F., Canton.
Miller, T. Clark, Massillon.
Morrow, E. O., Canton.
Morrow, E. P., Canton.
Myers, E. G., Canton.
Philipps, T. H., Canton.
Portman, E. O., Canton.
Post, S. B., Canton.
Pumphrey, R. J., Massillon.
Reed, J. L., Canton.
Reed, T. F., Massillon.
Robinson, S., Canton.
Santee, L. B., Marlboro.
Steele, W. C., New Berlin.
Tyrrell, E. M., Canton.
White, R. W., Alliance.

TOLEDO MEDICAL ASSOCIATION

Auxiliary since 1857 Annual Meeting in January

Thomas Hubbard .....President.
W. H. Gundrum .....Vice-President.
Charles P. Wagar .....Recording Secretary.
Charles W. Newton .....Corresponding Secretary.
James A. Duncan .....Treasurer.

MEMBERS

Becker, Bernard.
Beckwith, Seth W.
Betts, C.
Bodman, L. H.
Bond, John W.
Bowman, D. E.
Brand, W. W.
Chamberlin, David P.
Chapman, William C.
Cherry, William.
Coldham, William C.
Collamore, George A.

Cosgrove, Thomas.
Craver, S. Belle.
Curry, John H.
DeVilbiss, Allen.
Donnelly, James.
Dryer, C. C., Pemberville.
Duncan, James A.
Ely, J. D.,
Fella, F. J.
Fisher, Albert W.
Fisher, W. H.
Gifford, William R.
Gillette, William J.
Grube, W. W.
Gundrum, W. H.
Haag, D. E.
Hasencamp, O.
Hathaway, Harrison.
Heltman, E. W.
Heydrich, L. W.
Hubbard, Thomas.
Kirkley, Cyrus A.
Klauser, F. E.
Kitchen, Francis A.
Landman, Otto.
Lawless, James T.
Leslie, F. A.
Lockard, L. B.
McInnes, J. P.
McVety, Albert F.
Newton, C. W.
North, John.
Odell, Henry.
Peter, Robert.
Reed, Calvin H.
Reinhart, James C.
Rieg, Philip S.
Root, Henry A.
Royer, J. A.
Schnetzler, H. Marcus.
Schnetzler, J. U.
Sharpe, W. J.
Smith, Charles N.
Snyder, W. H.
Stewart, W. D.
Storz, S.
Suker, G. F.
Thorn, Samuel S.
Tobey, Henry A.
Todd, F. A.
Van Pelt, Charles L.
Wagar, Charles P.
Walker, Robert J.
Wickham, William.
Wilson, F. P.
Woods, Elizabeth.
Woods, Joseph T.

TUSCARAWAS COUNTY MEDICAL SOCIETY

Auxiliary since 1851 — Annual Meeting in April

C. U. Patterson..... President.
G. F. Lower .....Vice-President.
S. Shauwecker .....Secretary.
S. R. Thompson .....Treasurer.

MEMBERS

Beers, A. M., Newcomerstown.
Blickensderfer, Jos. Uhrichsville.
Barton, R. S., New Philadelphia.
Brannan, T. H., Canal Dover.
Finical, F. F., Dennison.
Fox, J. F., New Philadelphia.
Gentsch, D. C., New Philadelphia.
Gooding, J. J., Gilmore.

Gordon, Thos., Uhrichsville.
Gowdy, J. W. S., New Comerstown.
Groves, J. E., Urichsville.
Helms, F. G., Urichsville.
Hendershot, B. C., New Philadelphia.
Hewetson, H. L., Urichsville.
Hitchcock, J. L., Uhrichsville.
Hughes, L. H., Dennison.
Lower, G. F., Port Washington.
Lower, J. B., Bakersville.
Mackaman, H. A., New Philadelphia.
McCollam, J. A., Urichsville.
McCurdy, S. L., Pittsburg, Pa.
McKean, Wm., Canal Dover.
Miller, A. T., Shanesville.
Patterson, C. U., Uhrichsville.
Quinn, D. E., Dennison.
Richards, T. J. W., New Philadelphia.
Russell, E. S., Alliance.
Sawyer, C. H., Mineral Point.
Schultzbach, J. C., Strasburg.
Shauwecker, S., Shanesville.
Smith, J. M., New Philadelphia.
Smith, T. H., New Philadelphia.
Thompson, S. R., Uhrichsville.
Weiss, George, Ragersville.
Welty, O. S., Canal Dover.
White, C. C., Mineral Point.

UNION MEDICAL ASSOCIATION OF COLUMBIANA AND ADJOINING COUNTIES

Della M. Walker.....Secretary.
Auxiliary since 1879 Annual Meeting in May
F. T. Miles.....Vice-President.
Wm. Moore ..... Treasurer.
A. L. Cope.....President.

MEMBERS

Albright, G. H., East Fairfield.
Ambler, C. P., Asheville, N. C.
Anderson, James, Salem.
Bailey, W. N., East Liverpool.
Ballinger, S. F., Alliance.
Barckhoff, P. E., Salem.
Bates, James, Alliance.
Beach, A. M., Mineral Ridge.
Brooke, G. W., Ellsworth.
Calhoun, John N., Lisbon.
Calhoun, Wm., East Liverpool.
Campbell, J. S., Wellsville.
Clark, W. R., East Liverpool.
Cope, A. L., Winona.
Dales, S. J., Alliance.
Farr, M. C., Wellsville.
Fawcett, R. C., North Jackson.
Fawcett, C. L., Englewood, Ill.
Gilmore, W. N., West Point.
Graham, Frank, Lisbon.
Griselle, E., Salem.
Hammond, J. R., Wellsville.
Hartford, P. C., East Palestine.
Heck, S., Salem.
Hill, A. J., Minerva.
Hobbs, W. A., East Liverpool.
Hoover, C. M., Alliance.
Hughes, W. K., Berlin Centre.
Hullin, O. W., Greenford.
Johnson, M., Alliance.
Johnson, L. L., Alliance.
King, F. M., Damascus.

King, A. L., Youngstown.
Kurtz, H. B., Leetonia.
Lichty, M. J., Alliance.
McConnell, S. M., Wellsville.
McCready, S. R., Leetonia.
McFarland, W. S., Wellsville.
McLaughlin, J. V., Lisbon.
Marquis, T. B., Lisbon.
Mealy, H. M., Palmyra.
Miles, F. T., Salem.
Miller, D. J., North Benton.
Moore, Wm., Lisbon.
Moore, F. P., Lisbon.
Nevin, J. E., Negley.
Nevin, W. C., Lisbon.
Ogden, C. B., East Liverpool.
Park, B. R., Wellsville.
Patterson, S. J., Elkton.
Pelley, H. J., Dungannon.
Ramsey, P. C., Alliance.
Roach, J. A., Alliance.
Santee, L. B., Marlborough.
Schaffer, H. H., Alliance.
Schiller, A. W., Salem.
Sturgeon, J., Leetonia.
Temple, J. C., Alliance.
Tressel, J. H., Alliance.
Walker, Della M., Salem.
Yates, John, Salem.
Yengling, A. C., Salem.

UNION MEDICAL ASSOCIATION OF NORTHEASTERN OHIO

A. B. Campbell..... President.
B. Chapman .....First Vice-President.
H. Blankenborn .....Second Vice-President.
J. H. Seiler.....Recording Secretary.
D. S. Bowman.....Corresponding Secretary.
H. H. Jacobs..... Treasurer.

MEMBERS

Aldrich, C. J., Cleveland.
Allen, Dudley P., Cleveland.
Ambler, C. P., Canton .
Applegate, F. A., Windom.
Armstrong, H. A., Akron.
Baird, R. J., Creston.
Baker, A. R., Cleveland.
Baker, W. O., Louisville.
Barnes, R. H., Youngstown.
Barnes, S. P., Massillon.
Barrett, J. E., Wooster.
Bates, James, Alliance.
Bauer, M. M., Lake P. O.
Bauer, F. J., Mogadore.
Beach, A. M., Mineral Ridge.
Biechele, Robt. A., Canton.
Blankenhorn, H., Orrville.
Bowman, D. S., Akron.
Boyd, James P., Akron.
Brannan, F. H., Canal Dover.
Brant, A. C., Canton.
Brant, E. D., Canton.
Braschear, B. B., Cleveland.
Brintvall, A., Liverpool.
Britton, E. E., Spencer.
Brooke, Geo. W., Ellsworth.
Bruner, Wm. E., Cleveland.
Burns, Katherine, Canton.
Bye, J. M., Canton.
Campbell, A. B., Canal Fulton.
Carnes, N. M., Cleveland.
Carpenter, E. G., Cleveland.

Casper, F., Niles.
Cassidy, Jas. H., Sharon.
Cassidy, Thos. K., Sharon.
Chapman, B., Copley.
Cleaver, J. Vale, Akron.
Coates, B. O., Cleveland.
Conklin, S. S., Canton.
Conn, Eli, Akron.
Connor, H. E., Akron.
Corl, H. E., Middle Branch.
Cox, S. S., Lodi.
Coyle, H. J., Canton.
Crawford, Thos. P., Canton.
Crile, G. W., Cleveland.
Davison, C. C., Akron.
Dawson, N. B., Sterling.
De Witt, John P., Pierce.
Dickson, J. A., Youngstown.
Dougherty, T. E., Greentown.
Dutton, C. F., Cleveland.
Ebright, L. S. Akron.
Essick, Geo. C., Maximo.
Everhard, N. S., Wadsworth.
Eyer, Alvin, Cleveland.
Fergueson, J. W., Canaan.
Fisher, H. S., Newton Falls.
Fisher, H. M., Akron.
Flickinger, T. E., North Industry.
Foltz, A. E., Akron.
Foshay, P. Max, Cleveland.
Fonser, A. K., Akron.
Foulks, M. C., Canton.
Fox, J. T., New Philadelphia.
Fraunfelter, Jas., Canton.
Freeman, C. D., Medina.
Fuller, A. B., Loudonville.
Gardner, D. S., Massillon.
Gibson, R. D., Youngstown.
Gillett, G. S., Hinckley.
Goodrich, C. H., Sandyville.
Grant, J. G., Akron.
Greenamyer, P. S., Orrville.
Hamann, C. S., Cleveland.
Haney, J. C., Dalton.
Harmon, J., Warren.
Harmon, J. D., Warren.
Harper, E. B., Clinton.
Herrick, H. J., Cleveland.
Hiddleston, C. S., Atwater.
Hitchcock, E., Akron.
Hobson, J. T., Cleveland.
Hollis, C. W., Lafayette.
Hoover, C. F., Cleveland.
Hoover, D. E., Warren.
Hough, W. S., Cuyahoga Falls.
Hudson, J. T., Canton.
Hudson, S., Medina.
Humiston, Wm. H., Cleveland.
Humphrey, E., Akron.
Hunter, T.S., Ashland.
Hunter, Thos., Seville.
Hutton, C. T., Minerva.
Jacobs, W. C., Akron.
Jacobs, H. H., Akron.
Jamison, J. R., Apple Creek.
Johnson, F. M., Canton.
Johnson, Luther, Alliance.
Jones, F. S., Medina.
Kohler, H. D., Mineral Point.
Knowlton, W. A., Cleveland.
Kurtz, H. B., Leetonia.
Landor, J. H., Canton.
Leberman, E. O., Akron.
Lee, J. L., Akron.
Leonard, C. S., Ravenna.
Leonard, W. W., Akron.
Lincoln, Walter, Cleveland.
Loughead, B. B., Ravenna.
Lyman, C. N., Wadsworth.
McCartney, Jno., Girard.
McCauley, B. M., West Salem.
McConnell, L. G., Northfield.
McKeen, Wm., Dundee.
McLean, J. F., New Philadelphia.

McMillen, D. H., Orrville.
Mantey, Charles, Minerva.
March, E. J., Canton.
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Martin, T. C., Cleveland.
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Miller, T. Clark, Massillon.
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Parks, Thos. C., Akron.
Peck, Geo. S., Youngstown.
Phillips, T. H., Canton.
Pixley, S., Akron.
Pope, F. F. H., Dalton.
Portman, E. O., Canton.
Post, S. B., Canton.
Preble, Edward, Cleveland.
Prichard, L. W., W. Farmington.
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Roach, J. A., Alliance.
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Schuffelt, H. M., Canton.
Scott, N. Stone, Cleveland.
Scott, X. C., Cleveland.
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Shirey, J. L., Akron.
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Sipher, J. N., Cleveland.
Sippy, A. F., Akron.
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Skeel, R. E., Cleveland.
Smith, D. B., Cleveland.
Smith, T. D., Hartville.
Smith, W. G., Ravenna.
Sorrick, J. M., Krumsoy.
Spencer, E. R., Doylestown.
Sperry, W., Tallmadge.
Starr, G. L., Hudson.
Steele, Wm. C., New Berlin.
Stoll, J. H., Wooster.
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Theiss, H. C., Akron.
Tressil, J. H., Alliance.
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Tyrrell, Esther M., Canton.
Underwood, E. S., Akron.
Upson, H. S., Cleveland.
Virtue, C. W., Akron.
Waite, Jas. E., Lodi.
Wall, J. J., Mallet Creek.
Waldron, S. P., Akron.

Walker, A. B., Canton.
Welty, Cullen, Cleveland.
Wenner, R. J., Cleveland.
Whelan, H. E., Youngstown.
Willey, A. G., Spencer.
Williams, M. L., Warren.
Williamson, F. B., Massillon.
Wilson, A. C., Youngstown.
Wirt, W. E., Cleveland.
Wise, S. P., Millersburg.
Woods, S. T., Loyal Oak.
Workman, T. W., Akron.
Wright, S. J., Tallmadge.
Wuchter, Geo. H., Wadsworth.
Ziegler, C. R., Carrolton.
Zimmerman, H. A., Youngstown.

WARREN COUNTY MEDICAL SOCIETY

Auxiliary since 1879 Meets semi-annually in May and October

A. C. Roberts ..... President.
B. H. Blair ..... Vice-President.
E. S. Stevens ..... Secretary.
C. A. Hough ..... Treasurer.

MEMBERS

Bishop, L., Loveland.
Bishop, N. W., Loveland.
Blair, B. H., Lebanon.
Collins, J. B., Butlerville.
Couden, J. T., Morrow.
Death, H. J., Franklin.
Evans, F. R., Franklin.
Evans, Otho, Franklin.
Evans, R. S., Franklin.
Fisher, Herschel, Lebanon.
Flemming, J. C., Carlisle.
Frost, F. H., Lebanon.
Hall, C. T., Mason.
Hebble, D. W., Springboro.
Hough, C. A., Lebanon.
Lind, G. D., Lebanon.
McCready, Jas., Monroe.
Michel, Ralph, Chicago, Ill.
Moss, W. F., Mainville.
Mounts, Leonard, Morrow.
Mounts, J. L., Morrow.
Oglesby, W. E., Waynesville.
Roberts, A. C., Morrow.
Scott, John, Cincinnati.
Scott, Wm., Loveland.
Scoville, S. S., Lebanon.
Shaffer, W. I., Ridgeville.
Stevens, A. S., King's Mills.
Stevens, E. S., Lebanon.
Tichenor, E. J., Lebanon.
Vandervoort, J. W., Harveysburg.
Walter, Otto, Bethany.
Ward, J. W., Lytle.
Williams, D. A., Franklin.
Witham, J. E., Harveysburg.
Wright, J. W., Red Lion.
Wright, A. T., Blueball.

CHAPTER XV

CONSTITUTION AND BY-LAWS

OF THE

OHIO STATE MEDICAL SOCIETY

ADOPTED AT ZANESVILLE MAY 16, 1894
AMENDED AT COLUMBUS, MAY 5, 1898

ARTICLE I

TITLE

The name of this Association shall be the "OHIO STATE MEDICAL SOCIETY."

ARTICLE II

OBJECTS

The objects of this Society shall be the advancement of medical knowledge; the elevation of professional character; the protection of the professional interests of its members; the promotion of all measures adapted to the relief of the suffering, the improvement of the health, and the protection of the lives of the community.

ARTICLE III

MEMBERS

Section 1. The Society shall consist of *permanent members, delegate members,* and *honorary members.* Permanent and delegate members only shall be competent to hold office or transact the legislative business of the Society, as hereinafter specified.

Sec. 2. Delegate members shall receive their appointments from auxiliary societies. Before admission to a seat

they shall pay the regular dues for the year, and file with the Committee on Admission a certificate of delegation, signed by the President and Secretary of the auxiliary society which they represent. Should a delegate not become a permanent member by complying with the requirements of Sec. 3, Art III, he shall only be entitled to a copy of the Transactions and the privileges of membership for the meeting to which he is accredited.

Sec. 3. All regularly graduated practitioners of medicine in the State of Ohio shall be eligible to permanent membership. Applicants shall be vouched for by two permanent members, or shall present a certificate of membership in an auxiliary society, signed by the President and Secretary of such society, and their election shall require a majority vote at a regular meeting, their eligibility having been reported upon favorably by the Committee on Admission.

Every applicant shall deposit with the Treasurer the sum of $1.00 as a membership fee, and the dues for the current year, if not previously paid, which sums shall be returned if his application is rejected.

Sec. 4. Members of an auxiliary society, upon the presentation of a certificate of membership, signed by the President and Secretary of such society, and complying with the provisions of Art III, Sec. 3, shall be eligible to membership, although not in attendance on the meeting.

Sec. 5. The Society may elect eminent physicians, not residents of Ohio, as honorary members. They shall be exempt from payment of dues and assessments, and shall be presented with a copy of the Transactions.

Sec. 6. Members who have paid dues for thirty consecutive years shall be known as *life members,* and be exempt from dues and assessments.

Sec. 7. Members who are delinquent in dues or assessments shall not be entitled to a copy of the Transactions.

The non-payment of dues for three years shall forfeit

membership. The Treasurer shall include in his annual report the names of those who are delinquent for three years, but this list shall not be printed in the Transactions.

Sec. 8. The names of all permanent, delegate and honorary members shall be annually printed in the Transactions, in their respective classes.

ARTICLE IV

AUXILIARY SOCIETIES

Section 1. Any county or other local medical society in the State, whose Constitution recognizes the Code of Ethics of the American Medical Association, may become auxiliary to this Society, and shall be entitled to one delegate for every five members, and one additional for more than half that number.

Sec. 2. Every auxiliary society shall enforce the observance, by its members, of the Code of Ethics adopted by this Society.

Sec. 3. Any member of an auxiliary society, who is also a member of this Society, who shall feel aggrieved at the action of such auxiliary society in enforcing discipline, shall have the right to appeal to this Society.

Sec. 4. The Secretary of each auxiliary society, not less than one month preceding each annual meeting of this Society, shall make a full and correct catalogue, with post-office addresses, of its officers and members and transmit the same to the Secretary. If the name of a member is omitted from this catalogue that was contained in the last preceding catalogue, the reason for such omission must be given.

Sec. 5. In case of the death of any of its members, who are also members of this Society, it shall be the duty of the Secretary of each auxiliary society to transmit to the Secretary of this Society a suitable obituary notice for publication.

Article V

OFFICERS

Section 1. The officers of this Society shall be a President, four Vice-Presidents, Secretary, Assistant Secretary, and Treasurer and Librarian.

Sec. 2. At the first session of each year the President shall appoint a committee of five, which shall present to the Society nominations for all elective officers except that of President. The officers shall be elected by a ballot vote of a majority of all the members present, and shall enter upon their duties at the close of the meeting at which they are elected, and shall serve one year, or until their successors are elected.

Sec. 3. All vacancies in office, occurring in the interim of the meetings, shall be filled by appointment by the President.

Sec. 4. The Executive Committee of the Society shall be made up of the President, the four Vice-Presidents, the Secretary, the Treasurer, the Chairmen of the Standing Committees and the retiring Presidents of the three years last past. Five shall be considered a quorum for the transaction of business.

Article VI

DUTIES OF OFFICERS

Section 1. The President shall preside over the meetings, deliver an address, and perform such other duties as custom and parliamentary usage may require.

Sec. 2. The Vice-Presidents shall assist the President in the performance of his duties, and, in his absence, preside over the meetings, in the order of their seniority.

Sec. 3. The Secretary shall keep correct minutes of the proceedings of the Society, and furnish the same to the Committee on Publication, notify committees and society

delegates of their appointments, take charge of all manuscripts, papers, etc., read at the various meetings, and transfer the same to the Committee on Publication. He shall give due notice of the annual meetings, and give official notice to all auxiliary societies of resolutions, etc., passed by this Society that have reference to the said societies, and also notify them of the time for making their reports to this Society, and perform all other duties which the common usage of corporate bodies may require. His salary shall be one hundred and twenty-five dollars per annum.

Sec. 4. The Assistant Secretary shall assist the Secretary in the performance of his duties, as the latter may require, and act for him in his absence. His traveling and hotel expenses shall be borne by the Society.

Sec. 5. The Treasurer and Librarian shall receive all moneys due the Society, pay all bills countersigned by the Secretary, keeping an itemized account of all receipts and expenditures, with vouchers, and make a full report at each annual meeting. He shall have charge of all property belonging to the Society, the care of which is not otherwise provided for, keeping a complete catalogue of the same, and report the condition of this department at the annual meeting. He shall give bond for the faithful performance of his duties in the sum of $1,000, with two sureties, said bond to be approved by the Committee on Finance, and deposited with the Secretary. His salary shall be one hundred and twenty-five dollars per annum.

Sec. 6. The officers shall deliver all records, books, funds and other property belonging to their several offices, to their successors when the latter enter upon the discharge of their respective duties.

Sec. 7. The duties of the Executive Committee shall be to promptly consider and digest all business referred to it by the Society and to promptly report to the Society its findings and recommendations.

All motions, resolutions or other new and miscellan-

eous business shall be referred to the Executive Committee at once without motion; the Society, however, shall always have the right to order that a matter which would in regular order go to the Executive Committee, shall be considered at once, or to order a matter out of the hands of the Executive Committee for immediate consideration.

Article VII

COMMITTEES

The committees of this Society shall be Standing and Temporary. Standing committees are those whose duties continue from year to year. They shall each consist of five members, and, unless otherwise specified, shall be elected by the society, one member being elected each year. The Standing Committees shall be: Committees on Finance, Admission and Medical Societies, Ethics, Publication, Medical Legislation, Growth and Prosperity, and a Committee of one upon National Legislation. Temporary Committees are those whose functions cease with the meeting at which they are appointed. They shall be appointed by the President as the necessity for their existence arises.

Article VIII

DUTIES OF COMMITTEES

Section 1. The Committee on Arrangements shall, if no sufficient reasons prevent, be mainly composed of members at the place where the next annual meeting is to held. It shall provide suitable rooms and accommodations for the meeting, and, in all matters not otherwise provided for, superintend and protect the general interests of the Society. This Committee shall be appointed annually by the President.

Sec. 2. The Committee on Finance shall fix the amount of the yearly dues and special assessments, audit the account of the Treasurer, and have general charge of the monetary affairs of the Society.

Sec. 3. The Committee on Admission and Medical Societies shall examine and pass upon the qualifications of delegates and applicants for permanent membership, and the application for admission of auxiliary societies, and perform such other duties as may devolve upon it.

Sec. 4. The Committee on Ethics shall examine and report for the action of the Society, all cases of appeal from the auxiliary societies, and such other matters as may be referred to it by the Society. If any member or auxiliary society shall be charged, in writing, with any violation of the provisions of this Constitution and By-Laws, or with unprofessional conduct, a copy of such charges shall be furnished to him or its officers, and the accused and accuser cited to appear when the Committee shall proceed to hear the case, reserving its decision to be reported to the Society; except that the case of any member may be referred for adjudication to the auxiliary society of which he is a member, and from the decision of the auxiliary society an appeal may be carried to this Society.

Reports from this Committee, when unanimous, shall be acted upon without debate.

Sec. 5. The Committee on Publication, of which the President and Secretary shall be members *ex-officio*, shall examine all papers presented to the Society, and have printed in the Transaction such as it deems worthy of publication.

Sec. 6. The Committee on Legislation shall watch the course of State legislation on medical subjects, and take charge of such matters as shall be referred to it by the Society. All proposed legislation offered by any member of this Society, and all resolutions touching medical legislation, shall be referred to this Committee, which shall make a report thereon to this Society as soon as possible.

Article IX

DELEGATES

Section 1. The Delegates appointed by this Society to the American Medical Association, or other societies,

shall report briefly, in writing, through their Chairman, any action of the societies to which they were respectively delegated, which, in their judgment, merits the attention of this Society.

Article X

MEETINGS

Section 1. The meetings of this Society shall be held annually, at such time and place as the Society may appoint: *Provided*, that special meetings may be called at any time by the President, on the written request of twenty-five members. Due notice of all the meetings shall be given by the Secretary, and in case of a special meeting, the object for calling said meeting shall be distinctly set forth in the notice.

Sec. 2. Twenty-five members shall constitute a quorum for the transaction of business.

Article XI

CODE OF ETHICS

The Society adopts, as a part of its regulations, the Code of Ethics of the American Medical Association.

Article XII

AMENDMENTS

Every proposal for amending the Constitution shall be made in writing; and if such an amendment receives a majority of four-fifths of the members present, it shall be adopted; but otherwise, the amendment shall lie over until the next meeting, when it may be adopted by a majority of two-thirds of the members present.

Article XIII

Nothing in this Constitution shall be so construed as to deprive any one now a member of this Society of any rights or privileges held by him before the adoption of this Constitution.

BY-LAWS.

I

ORDER OF BUSINESS

1. The President, or in his absence, one of the Vice-Presidents, shall call to order, or, in case of the absence of all these officers, a Chairman shall be appointed *pro-tempore*.
2. Reading of minutes. Report of the Committee of Arrangements (on first day).
3. President's address (afternoon of second day).
4. Election of officers (afternoon of second day).
5. Selection of a place and time for the next meeting (afternoon of second day).
6. Business which requires early consideration.
7. Reports of Standing Committees.
8. Reports from Delegates to the American Medical Association, and other Societies.
9. (Written communications on medical subjects papers).
10. Oral communications.
11. New business.
12. Unfinished and miscellaneous business.
13. Adjournment.

II

In filling blanks, the longest time and the largest sum shall be put first.

III

Any three members may call for the ayes and nays.

IV

All questions of order, not especially provided for, shall be decided according to Cushing's Manual of Parliamentary Practice.

V

Not to exceed ten minutes shall be allowed for the reading of any paper.

VI

No paper shall occupy over thirty pages of the Transactions.

VII

All reports, papers and addresses presented to this Society by its members are the property of the Society, and shall be referred, without motion and without recommendation, to the appropriate committee; and it shall be considered a misdemeanor for the author of any such report or paper to permit the same to be published without giving the credit to this Society.

VIII

No speaker shall be allowed to speak a second time, on the same subject, without consent of the Society.

IX

The time allowed each speaker shall not exceed ten minutes, except by general consent.

X

The motion to adjourn, to lay on the table, or for the previous question, shall be decided without debate.

XI

The motion for the previous question, if decided in the negative, shall have no effect on the main question.

XII

Any of these By-Laws may be suspended at any time by a three-fourths vote of the members present. Every proposed amendment must be offered in writing; if it receives a four-fifths vote of the members present, it shall be adopted; but otherwise it shall lie over until the next meeting, when it may be adopted by a majority of two-thirds of the members present.

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